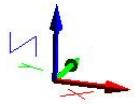
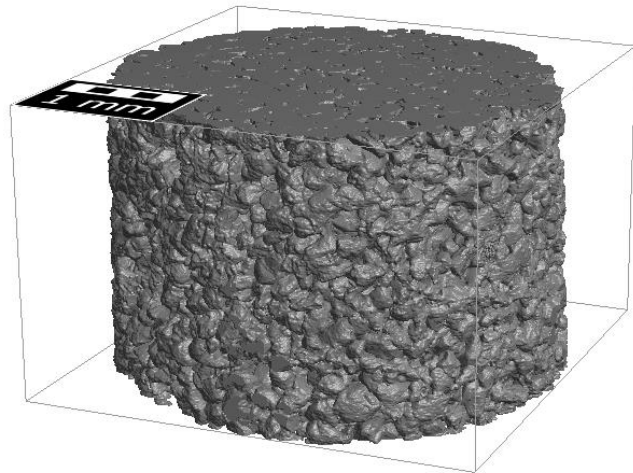




HOW-TO: SURROUND A DRILL CORE WITH A SOLID

Anne Blumer, Christian Hinz

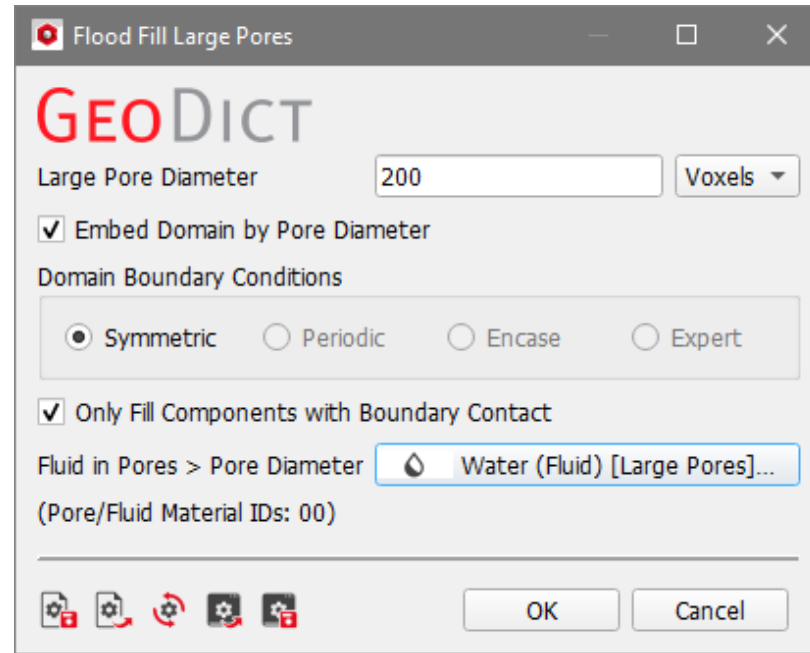
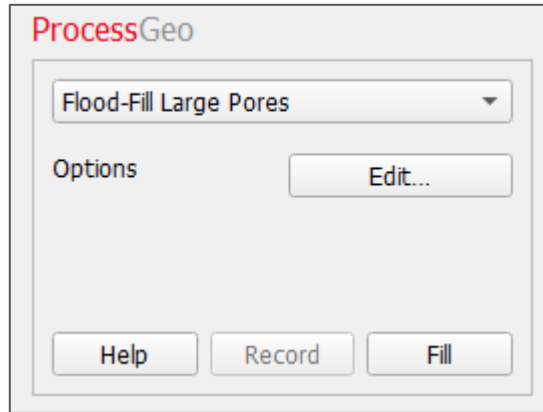
Material Information:
ID 00: Pore [invis.]
ID 01: Solid



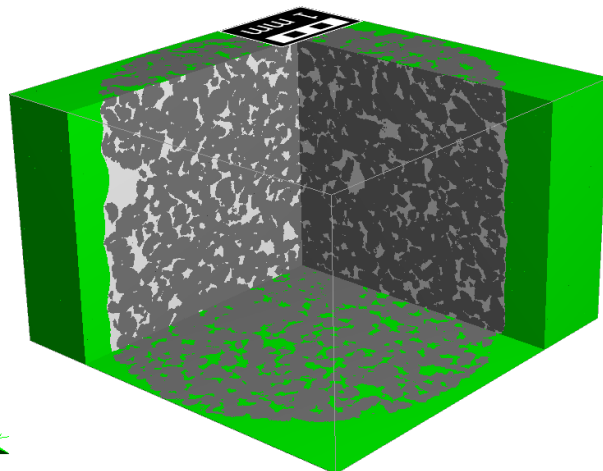
Sample structure: Gildehauser sandstone of Berg et al. (2016) segmented to pore and solid

- Segmentation of a cylindrical drill core can only be reduced to a cuboid domain
- Too much porous space is left which is not needed for further analysis
- We propose two different approaches to set the porous space outside of the core to a solid material
- Note: Once the surrounding volume is solid, the computed (physical) absolute permeability result needs to be corrected by the fraction of the thus excluded volume

METHOD 1: USE FLOOD-FILLING STEP 1

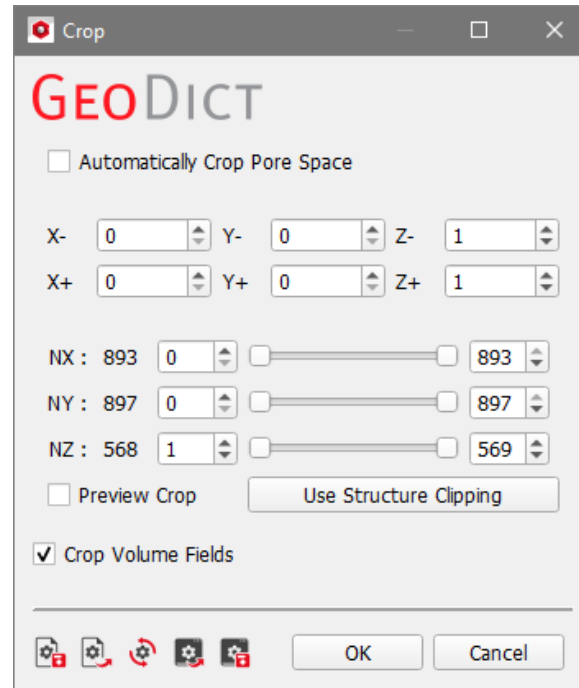
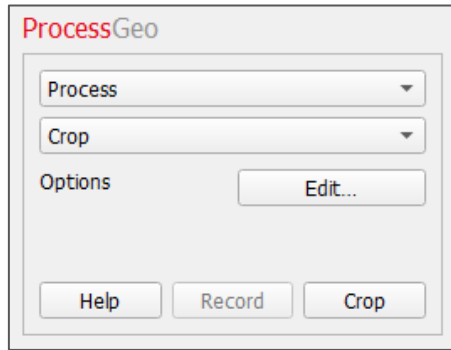


Material Information:
ID 00: Pore
ID 01: Solid
ID 02: Water [Large Pores]

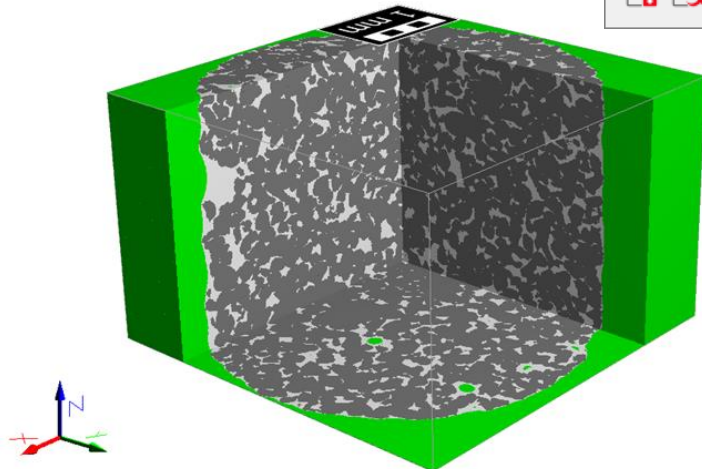


- Use **Model** -> **ProcessGeo** from the menu and select **Flood-Fill Large Pores** with the given settings
- The **Large Pore Diameter** should be large enough, s.t. only the surrounding pore volume is filled
 - Depends on the structure size
- Check **Only Fill Components with Boundary Contact** fills only pores that touch the domain boundary
- Set the fluid which is filled into the pores to a fluid that is not yet present in the structure (here Water)

METHOD 1: USE FLOOD-FILLING STEP 2

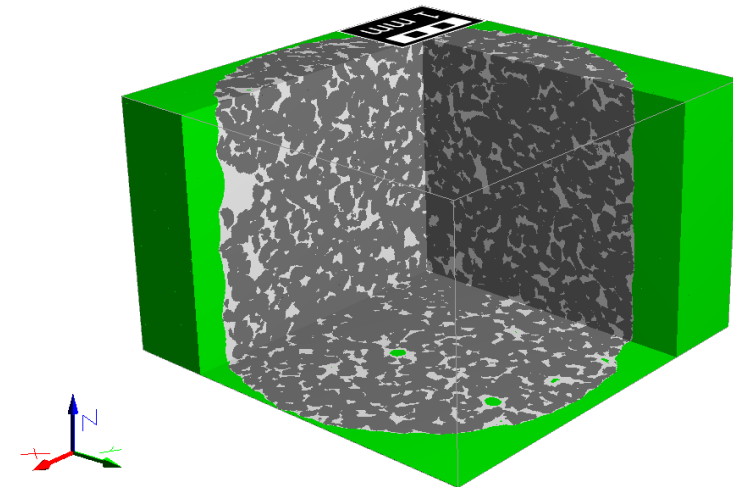


Material Information:
ID 00: Pore
ID 01: Solid
ID 02: Water [Large Pores]



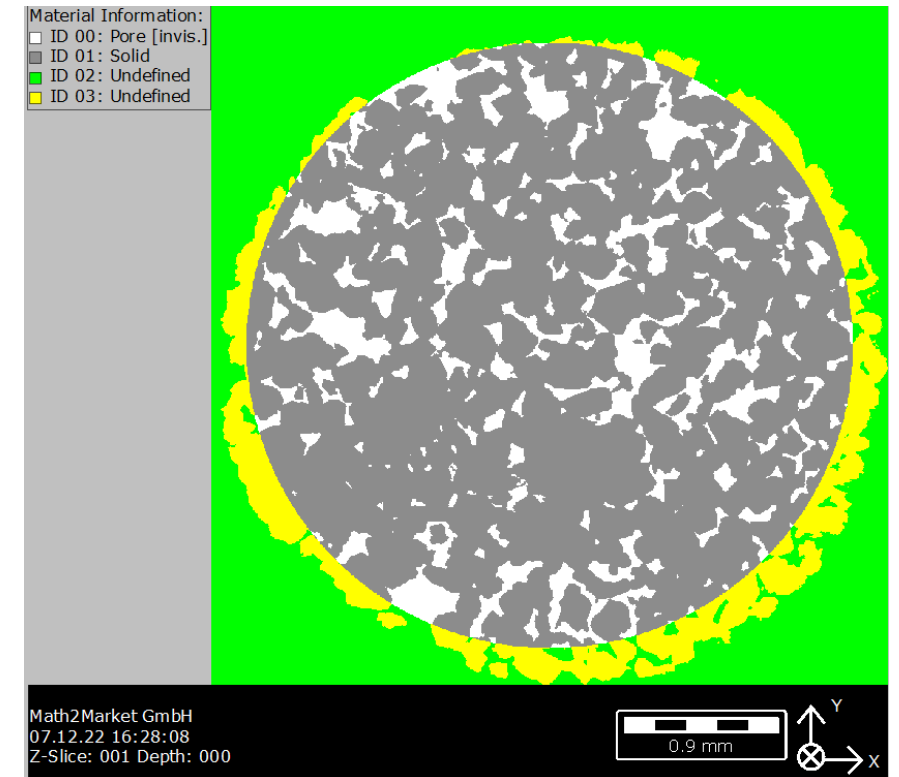
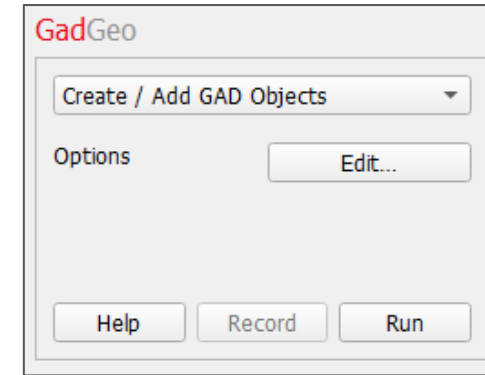
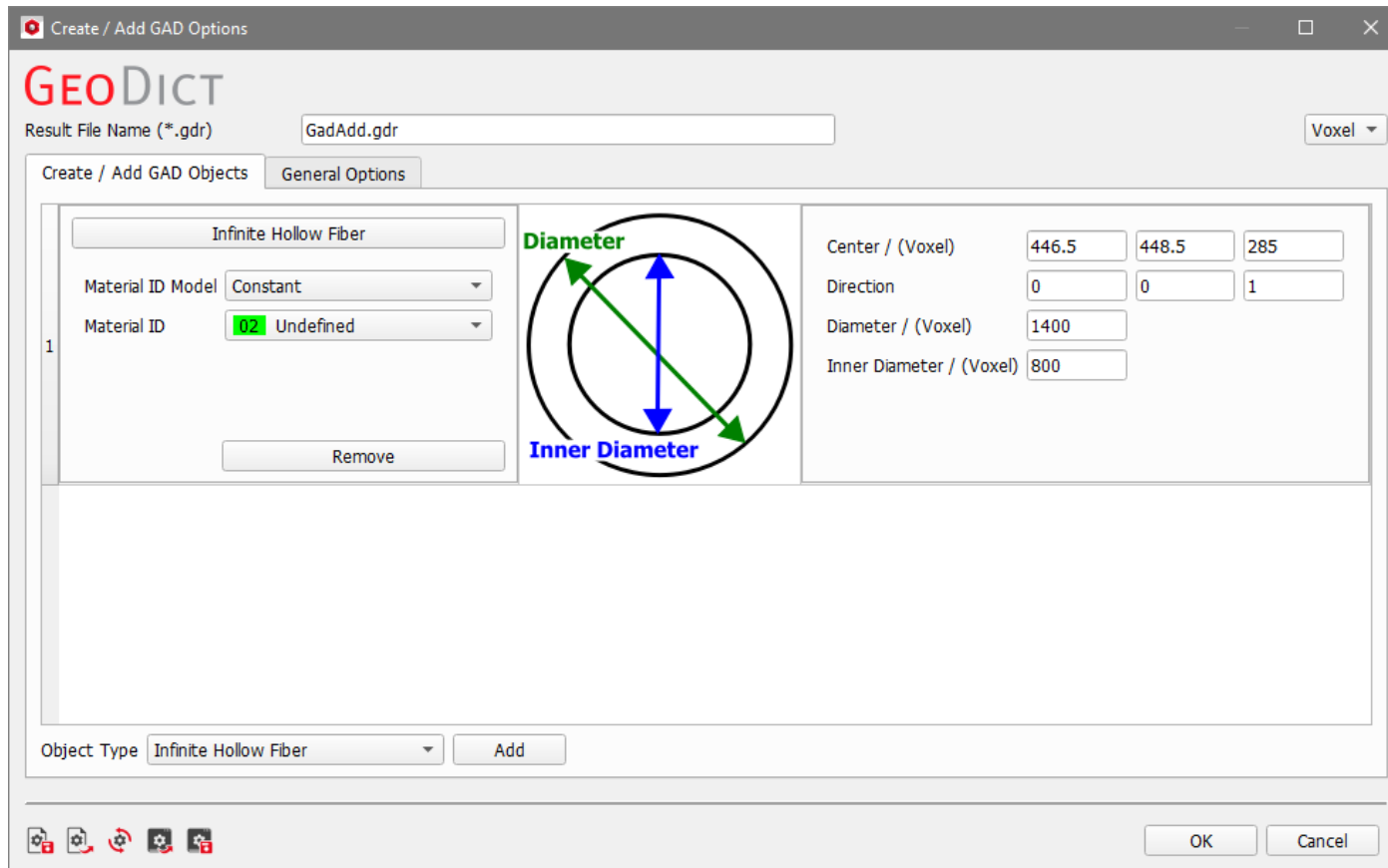
- The top and bottom layers in Z-direction are also flooded
- Use **ProcessGeo Crop** to cut off the first layer in Z+ and Z- direction
- Reassign the material of the filled pores (See step 3 on last slide)

Material Information:
ID 00: Pore
ID 01: Solid
ID 02: Solid



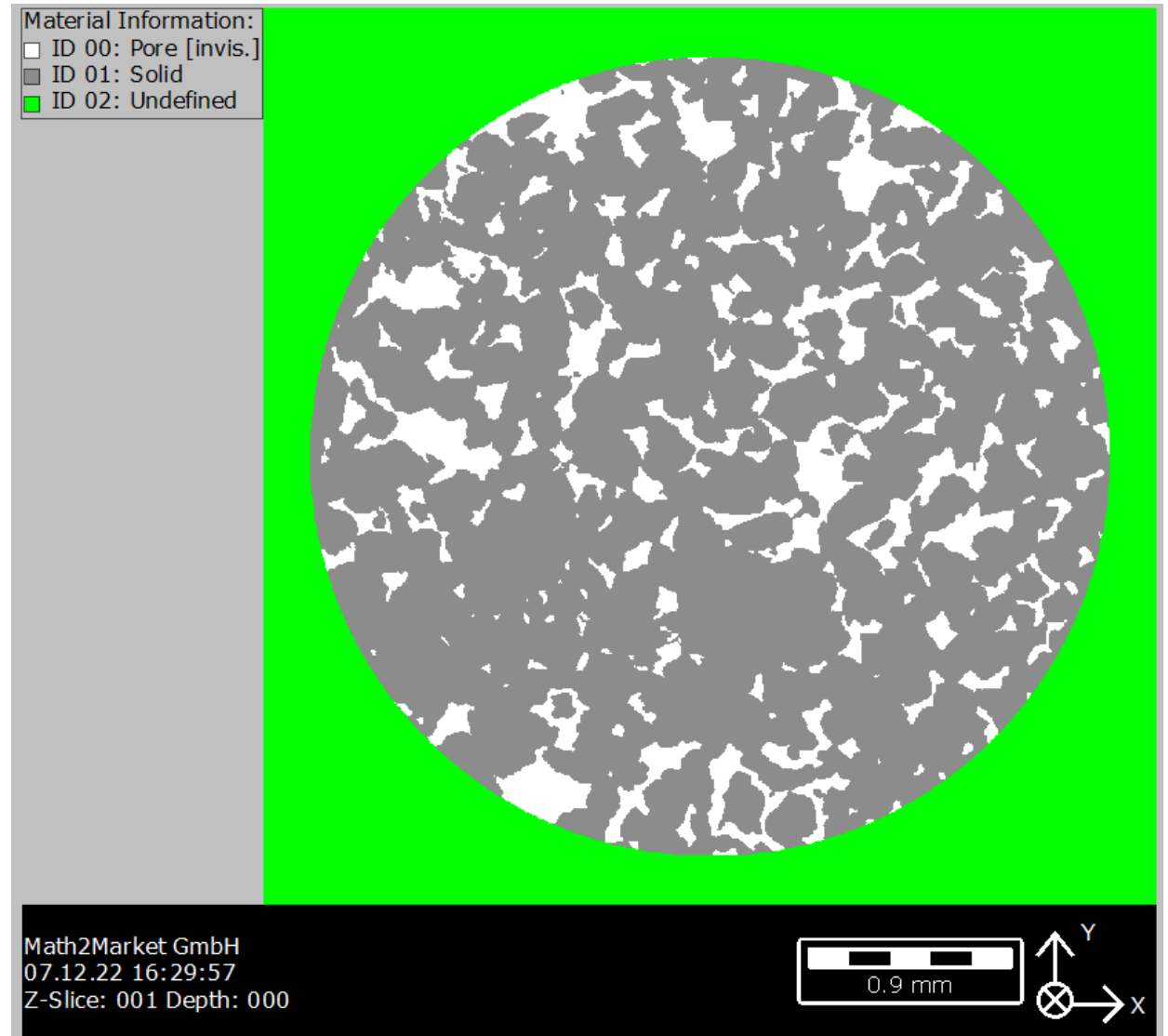
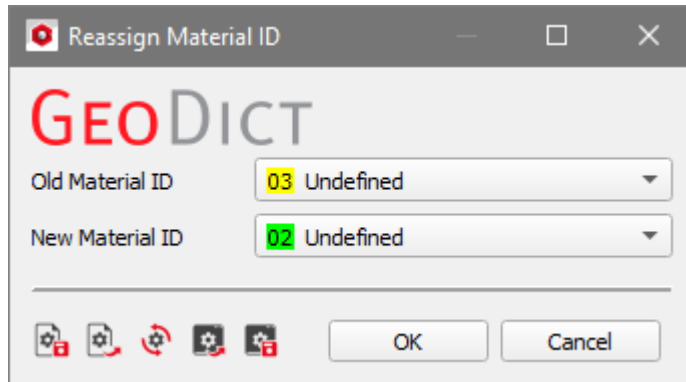
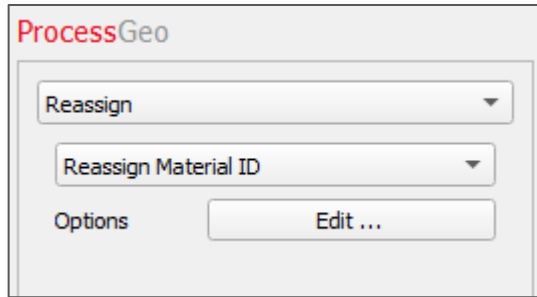
METHOD 2: PUT A CYLINDER AROUND STEP 1

- Use **Model** -> **GadGeo** from the menu and select **Create / Add GAD Objects** to create an **Infinite Hollow Fiber** with its center equal to the center of the core
- Inner diameter equals the diameter of the core

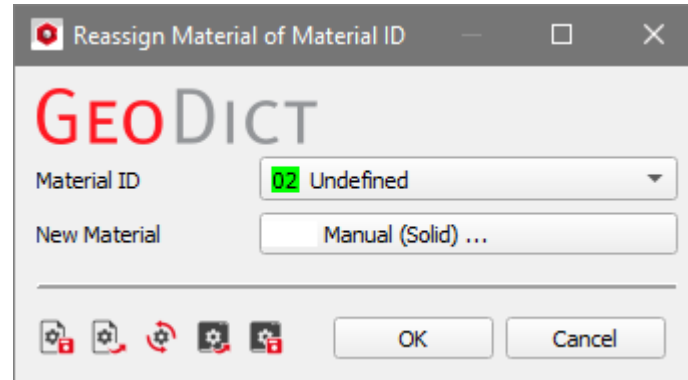
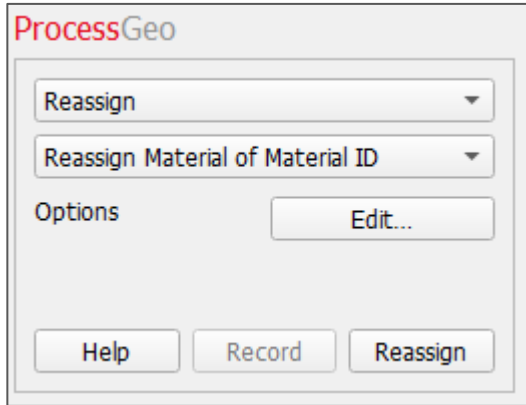


METHOD 2: PUT A CYLINDER AROUND STEP 2

- The overlap material gets a new Material ID
- Use **ProcessGeo Reassign Material ID** to set the overlap material ID to the ID of the surrounding fiber



REASSIGN MATERIAL OF MATERIAL IDS STEP 3



- Use **ProcessGeo Reassign Material of Material ID** to change the surrounding material to the desired solid.
- Select the correct Material ID (here ID 02)
- Click on the material displayed in New Material and choose the material you want to use from the Material Selector

