ADJUSTABLE FLOW CONTROL ASSEMBLIES, SYSTEMS, AND METHODS

FIELD

[0001] The present disclosure relates generally to flow control in oil wells and more particularly, but not by way of limitation, to adjustable flow control assemblies, systems, and methods.

BACKGROUND

[0002] Hydrocarbons, e.g., crude Oil and natural gas, occur naturally in subsurface deposits. After such deposits are located in commercial amounts, an oil well is drilled to develop the resources. Once the drilling process is finished, the well is completed to facilitate production. During production it is desirable to control the flow in production zones of the well.

SUMMARY

[0002a] In an aspect, a system for producing hydrocarbons from a formation, the system comprising: a tubing string extending from a surface location into a wellbore; a completion string fluidly coupled to the tubing string for extending into a target formation and producing fluids from the target formation; and wherein the completion string comprises: a plurality of isolation tools forming a plurality of production zones, at least one adjustable inflow control device disposed within a first production zone of the plurality of production zones, and at least one autonomous inflow control device serially and fluidly coupled to the at least one adjustable inflow control device and disposed within the first production zone.

[0002b] In another aspect, an assembly for restricting fluid flow into a completion string and restricting fluids based on one or more fluid characteristics, the assembly comprising: an adjustable inflow control device, the adjustable inflow control device for restricting flow of production fluids into the completion string; and a first autonomous inflow control device fluidly coupled to the inflow control device for restricting fluids based on one or more fluid characteristics.

[0002c] In an yet another aspect, a method of providing formation-specific flow control in a wellbore located in a production region of the world, the method comprising the steps of: providing a plurality of adjustable inflow control devices that can be adjusted onsite; providing a plurality of autonomous inflow control devices having a flow characteristics adjusted for a typical condition for formations in the production region of the world; determining the flow

characteristics desired for a specific formation in the region from which production is desired; adjusting the plurality of adjustable inflow control devices to obtain the desired flow characteristics; forming a plurality of production zones in the wellbore; and disposing at least one of the plurality of inflow control devices and one of the plurality of autonomous inflow control devices in one of the production zones.

BRIEF DESCRIPTION OF THE DRAWINGS

[0003] FIGURE 1 is a schematic diagram of a well system including an illustrative embodiment of a plurality of assemblies for restricting fluid flow into a completion string and restricting fluids based on one or more fluid characteristics;

[0004] FIGURE 2 is a schematic diagram presenting, inter alia, an illustrative embodiment of an assembly for restricting fluid flow into a completion string and restricting fluids based on one or more fluid characteristics;

[0005] FIGURE 3 is a schematic longitudinal cross section of a portion of a completion string showing an illustrative embodiment of assembly for restricting fluid flow into a completion string and restricting fluids based on one or more fluid characteristics;

[0006] FIGURE 4 is a schematic diagram of an autonomous inflow control device taken along 4-4 and circumferentially in FIGURE 3 and "unrolled";

[0007] FIGURE 5 is a schematic diagram showing an illustrative embodiment of a plurality of assemblies for restricting fluid flow into a completion string and restricting fluids based on one or more fluid characteristics;

[0008] FIGURE 6 is another illustrative embodiment of an assembly for restricting fluid flow into a completion string and restricting fluids based on one or more fluid characteristics; and

[0009] FIGURE 7 is a cross section taken along line 7-7 in FIGURE 6 and including the full circumference.