

ECLA EUROPEAN CLASSIFICATION

G21C **NUCLEAR REACTORS** (analogue computers therefor [G06G7/54](#); fusion reactors, hybrid fission-fusion reactors G21B; nuclear explosives G21J)

[N: **WARNING** [C1010]

The following IPC groups are not used in the internal ECLA classification scheme:

- [G21C1/01](#) covered by all other groups of G21C

- [G21C19/33](#) covered by all other subgroups of [G21C19/34](#)

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G21C1/00

Reactors

- G21C1/02 . Fast fission reactors, i.e. reactors not using a moderator; [N: Metal cooled reactors; Fast breeders]
- G21C1/02B . . [N: Characterised by the concept and properties of the core]
- G21C1/02B2 . . . [N: where the core is divided in zones with fuel and zones with breeding material]
- G21C1/02B4 . . . [N: Reactors not needing refueling, i.e. reactors of the type breed-and-burn, e.g. travelling or deflagration wave reactors or seed-blanket reactors] [N1204]
- G21C1/02F . . [N: cooled by a pressurised coolant (cooling arrangements [G21C15/00](#))]
- G21C1/03 . . cooled by a coolant not essentially pressurised, e.g. pool-type reactors
- G21C1/04 . Thermal reactors; [N: Epithermal reactors]
- G21C1/06 . . Heterogeneous reactors, i.e. in which fuel and moderator are separated
- G21C1/07 . . . Pebble-bed reactors; Reactors with granular fuel
- G21C1/08 . . . moderator being highly pressurised, e.g. boiling water reactor, integral super-heat reactor, pressurised water reactor ([G21C1/22](#) takes precedence)
- G21C1/08D [N: Reactors where the coolant is overheated]
- G21C1/08E [N: Boiling water reactors]
- G21C1/08F [N: Pressurised water reactors]
- G21C1/09 Pressure regulating arrangements, i.e. pressurisers
- G21C1/10 moderator and coolant being different or separated
- G21C1/12 moderator being solid, e.g. Magnox reactor [N: gas-graphite reactor]
- G21C1/14 moderator being substantially not pressurised, e.g. swimming-pool reactor ([G21C1/22](#) takes precedence)
- G21C1/16 moderator and coolant being different or separated, e.g. sodium-graphite reactor [N: sodium-heavy water reactor, organic coolant-heavy water reactor]
- G21C1/18 coolant being pressurised
- G21C1/20 moderator being liquid, e.g. pressure-tube reactor [N: also the construction of the pressure-tubes]
- G21C1/22 using liquid or gaseous fuel
- G21C1/24 . . Homogeneous reactors, i.e. in which the fuel and moderator present an effectively homogeneous medium to the neutrons
- G21C1/26 . . . Single-region reactors
- G21C1/28 . . . Two-region reactors

- G21C1/30 . Subcritical reactors; [N: Experimental reactors with exception of swimming-pool reactors or zero-energy reactors]
 - G21C1/30B . . [N: Experimental and irradiation arrangements inside the reactor (irradiation loops [G21C1/30D](#); material testing by neutrons [G01N23/00B](#))]
 - G21C1/30D . . [N: Irradiation loops]
 - G21C1/32 . Integral reactors, i.e. reactors wherein parts functionally associated with the reactor but not essential to the reaction, e.g. heat exchangers, are disposed inside the enclosure with the core ([G21C1/02](#) to [G21C1/30](#) take precedence) [N0802]
 - G21C1/32A . . [N: wherein the heat exchanger is disposed above the core] [N0802]
 - G21C1/32B . . [N: wherein the heat exchanger is disposed beneath the core] [N0802]
 - G21C1/32N . . [N: wherein the heat exchanger is disposed next to or beside the core] [N0802]
 - G21C1/32P . . [N: wherein the prime mover is also disposed in the vessel] [N0802]
- G21C3/00 Reactor fuel elements and their assemblies; Selection of substances for use as reactor fuel elements**
- G21C3/02 . Fuel elements [N: (manufacture thereof [G21C21/02](#))]
 - G21C3/04 . . Constructional details
 - G21C3/04B . . . [N: Means for removal of gases from fuel elements]
 - G21C3/04C . . . [N: Fuel elements comprising casings with a mass of granular fuel with coolant passages through them]
 - G21C3/04D . . . [N: Fuel elements with porous or capillary structure]
 - G21C3/06 . . . Casings; Jackets
 - G21C3/07 characterised by their material, e.g. alloys
 - G21C3/08 provided with external means to promote heat-transfer, e.g. fins, baffles
 - G21C3/10 End closures; [N: Means for tight mounting therefor]
 - G21C3/10B [N: Flattened end-closures]
 - G21C3/12 Means forming part of the element for locating it within the reactor core [N: means not forming part of the element [G21C5/06](#)]
 - G21C3/14 Means forming part of the element for inserting it into, or removing it from, the core; Means for coupling adjacent elements, [N: e.g. to form a stringer]
 - G21C3/16 . . . Details of the construction within the casing
 - G21C3/17 Means for storage or immobilisation of gases in fuel elements
 - G21C3/18 Internal spacers or other non-active material within the casing, e.g. compensating for expansion of fuel rods or for compensating excess reactivity ([interlayers \[G21C3/20\]\(#\)](#))
 - G21C3/20 with coating on fuel or on inside of casing; with non-active interlayer between casing and active material [N: with multiple casings or multiple active layers]
 - G21C3/22 . . with fissile or breeder material in contact with coolant
 - G21C3/24 . . with fissile or breeder material in fluid form within a non-active casing
 - G21C3/26 . . with fissile or breeder material in powder form within a non-active casing
 - G21C3/28 . . with fissile or breeder material in solid form within a non-active casing
 - G21C3/30 . Assemblies of a number of fuel elements in the form of a rigid unit
 - G21C3/32 . . Bundles of parallel pin-, rod-, or tube-shaped fuel elements

- G21C3/32F . . . [N: Means associated with the fuel bundle for filtering the coolant, e.g. nozzles, grids]
- G21C3/32K . . . [N: Means for the storage or removal of fission gases (means for the storage of fission gases in the elements [G21C3/16](#); means for the removal of fission gases from elements [G21C3/04](#))]
- G21C3/322 . . . Means to influence the coolant flow through or around the bundles
- G21C3/324 . . . Coats or envelopes for the bundles
- G21C3/324M [N: made of moderator material]
- G21C3/326 . . . comprising fuel elements of different composition; comprising, in addition to the fuel elements, other pin-, rod-, or tube-shaped elements, e.g. control rods, grid support rods, fertile rods, poison rods or dummy rods
- G21C3/328 Relative disposition of the elements in the bundle lattice
- G21C3/33 . . . Supporting or hanging of elements in the bundle ([spacer grids G21C3/34](#)); Means forming part of the bundle for inserting it into, or removing it from, the core; Means for coupling adjacent bundles
- G21C3/33L [N: Lower nozzle] [N1010]
- G21C3/33S [N: Comprising hold-down means, e.g. springs] [N1010]
- G21C3/33U [N: Upper nozzle] [N1010]
- G21C3/332 Supports for spacer grids
- G21C3/334 . . . Assembling [N: , maintenance or repair of] the bundles [N: (assembling, maintenance or repair of other reactor components [G21C19/20C](#))] [C1204]
- G21C3/335 . . . Exchanging elements in irradiated bundles
- G21C3/336 . . . Spacer elements for fuel rods in the bundle ([spacer grids G21C3/34](#))
- G21C3/338 Helicoidal spacer elements
- G21C3/34 Spacer grids
- G21C3/34A [N: Compact spacer grids, e.g. made of a plate or a blade]
- G21C3/34E [N: Spacer grids formed by metallic wires, e.g. springs]
- G21C3/34F [N: Fabrication of spacer grids]
- G21C3/344 formed of assembled tubular elements
- G21C3/348 formed of assembled non-intersecting strips
- G21C3/352 formed of assembled intersecting strips
- G21C3/356 being provided with fuel element supporting members
- G21C3/356D [N: Supporting members formed only by deformations in the strips]
- G21C3/356F [N: Supporting members formed only of elements fixed on the strips]
- G21C3/36 . . . Assemblies of plate-shaped fuel elements or coaxial tubes
- G21C3/38 . . . Fuel units consisting of a single fuel element in a supporting sleeve [N: or in another supporting element]
- G21C3/40 . . . Structural combination of fuel element with thermoelectric element for direct production of electric energy from fission heat ([for temperature measurement G21C17/10](#)) [N: or with another arrangement for direct production of electric energy, e.g. a thermionic device (combination with thermoelements for temperature measurements [G21C17/10S](#))]
- G21C3/42 . . . Selection of substances for use as reactor fuel
- G21C3/44 . . . Fluid or fluent reactor fuel

- G21C3/46 . . . Aqueous compositions
- G21C3/48 True or colloidal solutions of the active constituent
- G21C3/50 Suspensions of the active constituent; Slurries
- G21C3/52 . . . Liquid metal compositions
- G21C3/54 . . . Fused salt, oxide or hydroxide compositions
- G21C3/56 . . . Gaseous compositions; Suspensions in a gaseous carrier
- G21C3/58 . . Solid reactor fuel [N: Pellets made of fissile material]
- G21C3/60 . . . Metallic fuel; Intermetallic dispersions
- G21C3/62 . . . Ceramic fuel
- G21C3/62B [N: Oxide fuels]
- G21C3/62J [N: Coated fuel particles]
- G21C3/64 Ceramic dispersion fuel, e.g. cermet

G21C5/00 Moderator or core structure; Selection of materials for use as moderator

- G21C5/02 . Details
- G21C5/04 . . Spatial arrangements allowing for Wigner growth
- G21C5/06 . . Means for locating or supporting fuel elements [N: (means forming part of the element [G21C3/12](#))]
- G21C5/08 . . Means for preventing undesired asymmetric expansion of the complete structure; [N: Stretching devices, pins]
- G21C5/10 . . Means for supporting the complete structure [N: (arrangements for supporting vessels and core-structures [G21C13/024](#))]
- G21C5/12 . characterised by composition, e.g. the moderator containing additional substances which ensure improved heat resistance of the moderator [N: (purification of fluid moderators during the operation of the reactor [G21C19/30](#))]
- G21C5/12B . . [N: Moderators made of organic materials]
- G21C5/12G . . [N: Carbonic moderators (carbon and graphite in general [C01B31/00](#); refractory carbon-bulbs [C04B35/00](#); carbon electrodes [C25B](#))]
- G21C5/14 . characterised by shape
- G21C5/16 . . Shape of its constituent parts
- G21C5/18 . characterised by the provision of more than one active zone
- G21C5/20 . . wherein one zone contains fissile material and another zone contains breeder material
- G21C5/22 . . wherein one zone is a superheating zone

G21C7/00 Control of nuclear reaction

- G21C7/00B . [N: Flux flattening]
- G21C7/02 . by using self-regulating properties of reactor materials, [N: e.g. Doppler effect] ([arrangements that involve temperature stability G21C7/32](#))
- G21C7/04 . . of burnable poisons ([burnable poisons in fuel rods G21C3/326](#))

- G21C7/06 . by application of neutron-absorbing material, i.e. material with absorption cross-section very much in excess of reflection cross-section
- G21C7/08 . . by displacement of solid control elements, e.g. control rods
- G21C7/10 . . . Construction of control elements
- G21C7/103 Control assemblies containing one or more absorbants as well as other elements, e.g. fuel or moderator elements
- G21C7/107 Control elements adapted for pebble-bed reactors
- G21C7/11 Deformable control elements, e.g. flexible, telescopic, articulated
- G21C7/113 Control elements made of flat elements; Control elements having cruciform cross-section
- G21C7/117 Clusters of control rods; Spider construction
- G21C7/12 . . . Means for moving control elements to desired position ([dropping rods in an emergency G21C9/02](#))
- G21C7/14 Mechanical drive arrangements
- G21C7/16 Hydraulic or pneumatic drive
- G21C7/18 . . . Means for obtaining differential movement of control elements
- G21C7/20 . . . Disposition of shock-absorbing devices ([shock-absorbers in general F16F](#)) [N: [Braking arrangements](#)]
- G21C7/22 . . by displacement of a fluid or fluent neutron-absorbing material, [N: [e.g. by adding neutron-absorbing material to the coolant](#)]
- G21C7/24 . . Selection of substances for use as neutron-absorbing material
- G21C7/26 . by displacement of the moderator or parts thereof [N: [by changing the moderator concentration](#)]
- G21C7/27 . . Spectral shift control
- G21C7/28 . by displacement of the reflector or parts thereof
- G21C7/30 . by displacement of the reactor fuel or fuel elements
- G21C7/32 . by varying flow of coolant through the core [N: [by adjusting the coolant or moderator temperature](#)]
- G21C7/34 . by utilisation of a primary neutron source
- G21C7/36 . Control circuits
- G21C9/00** **Emergency protection arrangements structurally associated with the reactor** [N: [e.g. safety valves provided with pressure equalisation devices](#)] ([emergency cooling arrangements G21C15/18](#))
- G21C9/00F . [N: [against explosions e.g. blast shields](#)]
- G21C9/00I . [N: [against Na- or Ka- reactions](#)]
- G21C9/004 . Pressure suppression
- G21C9/008 . . by rupture-discs or -diaphragms
- G21C9/012 . . by thermal accumulation or by steam condensation, e.g. ice condensers

- G21C9/016 . Core catchers
- G21C9/02 . Means for effecting very rapid reduction of the reactivity factor under fault conditions, e.g. reactor fuse; [N: Control elements having arrangements activated in an emergency] (control elements per se [G21C7/00](#))
- G21C9/02F . . [N: Reactor fuses]
- G21C9/02H . . [N: Rupture diaphragms]
- G21C9/027 . . by fast movement of a solid, e.g. pebbles
- G21C9/033 . . by an absorbent fluid
- G21C9/04 . Means for suppressing fires [N: Earthquake protection]
- G21C9/06 . . Means for preventing accumulation of explosives gases, e.g. recombiners [N: (no documents)]

G21C11/00 **Shielding structurally associated with the reactor**

- G21C11/02 . Biological shielding (in general [G21F](#)) [N: Neutron or gamma shielding]
- G21C11/02B . . [N: inside the reactor vessel]
- G21C11/02B2 . . . [N: structurally combined with the casing]
- G21C11/02D . . [N: in apertures or channels through a wall]
- G21C11/02F . . [N: characterised by the form or by the material]
- G21C11/04 . . on waterborne craft
- G21C11/06 . Reflecting shields, i.e. for minimising loss of neutrons
- G21C11/08 . Thermal shields; Thermal linings, i.e. for dissipating heat from gamma radiation which would otherwise heat an outer biological shield [N: Thermal insulation]
- G21C11/08B . . [N: consisting of a non-metallic layer of insulating material]
- G21C11/08D . . [N: consisting of one or more metallic layers]
- G21C11/08D2 . . . [N: consisting exclusively of several metallic layers]
- G21C11/08E . . [N: consisting of a combination of non-metallic and metallic layers, e.g. metal-sand-metal-concrete]
- G21C11/08F . . [N: consisting of a stagnant or a circulating fluid]

G21C13/00 **Pressure vessels; Containment vessels; Containment in general (for chemical or physical processes [B01J3/00](#); pressure vessels in general [F16J12/00](#))**

- G21C13/02 . Details
- G21C13/02G . . [N: Ventilating arrangements]
- G21C13/024 . . Supporting constructions for pressure vessels or containment vessels
- G21C13/028 . . Seals, e.g. for pressure vessels or containment vessels
- G21C13/028B . . . [N: for container apertures]
- G21C13/032 . . Joints between tubes and vessel walls, e.g. taking into account thermal stresses
- G21C13/036 . . . the tube passing through the vessel wall, i.e. continuing on both sides of the wall

- G21C13/04 . . Arrangements for expansion and contraction
- G21C13/06 . . Sealing-plugs (for pressure vessels in general [F16J13/00](#))
- G21C13/067 . . . for tubes, e.g. standpipes; Locking devices for plugs
- G21C13/067B [N: Seals for the plugs]
- G21C13/073 . . . Closures for reactor-vessels, e.g. rotatable
- G21C13/073B [N: Seals for closures or for rotatable closures] [N9507]

- G21C13/08 . Vessels characterised by the material; Selection of materials for pressure vessels
- G21C13/087 . . Metallic vessels
- G21C13/087T . . . [N: Tube-type vessels, e.g. for not essentially pressurised coolants]
- G21C13/093 . . Concrete vessels
- G21C13/093P . . . [N: made of prestressed concrete]
- G21C13/093P2 [N: Particulars concerning prestressing devices and cables]

- G21C13/10 . Means for preventing contamination in the event of leakage, [N: e.g. double wall]

- G21C15/00 Cooling arrangements within the pressure vessel containing the core; Selection of specific coolants**

- G21C15/02 . Arrangements or disposition of passages in which heat is transferred to the coolant; [N: Coolant flow control devices ([G21C19/04](#) takes precedence; coolant flow control through fuel assemblies, e.g. flow restrictors [G21C3/322](#))]
- G21C15/04 . . from fissile or breeder material [N: ([G21C3/32](#) takes precedence)]
- G21C15/06 . . . in fuel elements
- G21C15/08 . . from moderating material
- G21C15/10 . . from reflector or thermal shield
- G21C15/12 . . from pressure vessel; from containment vessel
- G21C15/14 . . from headers; from joints in ducts

- G21C15/16 . comprising means for separating liquid and steam (separating in general [B01D](#); steam traps [F16D](#))

- G21C15/18 . Emergency cooling arrangements; Removing shut-down heat
- G21C15/18P . . [N: comprising powered means, e.g. pumps]

- G21C15/20 . Partitions or thermal insulation between fuel channel and moderator

- G21C15/22 . Structural association of coolant tubes with headers (joints of tubes in general [F16L](#))

- G21C15/24 . Promoting flow of the coolant (electrodynamic pumps [H02K44/02](#))
- G21C15/243 . . for liquids
- G21C15/247 . . . for liquid metals
- G21C15/25 . . . using jet pumps
- G21C15/253 . . for gases, e.g. blowers
- G21C15/257 . . using heat-pipes [N: (in general [F28D](#), [F28F](#))]
- G21C15/26 . . by convection, e.g. using chimneys, using divergent channels

- G21C15/28 . Selection of specific coolants (if serving as the moderator [G21C5/12](#); compositions per se [C09K5/00](#); [N: organic coolants [G21C5/12B](#)]); [N: Additions to the reactor coolants, e.g. against moderator corrosion (purification and regeneration of the reactor coolants [G21C19/30](#))]

- G21C17/00** **Monitoring; Testing (measuring in general G01); [N: Maintaining]**

- G21C17/00B . [N: Mechanical simulators (electrical or magnetic simulators [G06G7/54](#))]
- G21C17/00C . [N: Detection of leaks (by testing the coolant or the moderator [G21C17/04](#))]
- G21C17/003 . Remote inspection of vessels, e.g. pressure vessels
- G21C17/007 . . Inspection of the outer surfaces of vessels
- G21C17/01 . . Inspection of the inner surfaces of vessels
- G21C17/013 . . Inspection vehicles

- G21C17/017 . Inspection or maintenance of pipe-lines or tubes in nuclear installations

- G21C17/02 . Devices or arrangements for monitoring coolant or moderator
- G21C17/02F . . [N: Solid moderators testing, e.g. graphite]
- G21C17/022 . . for monitoring liquid coolants or moderators
- G21C17/022C . . . [N: Chemical surface treatment, e.g. corrosion (corrosion prevention in presence of water from scale removal or by modification of the properties of the liquid [C02F5/00](#); inhibiting corrosion by adding corrosion inhibitors [C23F11/00](#)) [N1010]
- G21C17/025 . . . for monitoring liquid metal coolants [N: (molten metal sampling in general [G01N1/12B](#))]
- G21C17/025D [N: Liquid metal leaks detection (detecting leaks in pipe-line systems in general [F17D5/00](#))]
- G21C17/028 . . for monitoring gaseous coolants
- G21C17/032 . . Reactor-coolant flow measuring or monitoring [N: (measuring volume or mass flow in general [G01F](#))]
- G21C17/035 . . Moderator- or coolant-level detecting devices [N: (indicating or measuring liquid level in general [G01F23/00](#))]
- G21C17/038 . . Boiling detection in moderator or coolant
- G21C17/04 . . Detecting burst slugs
- G21C17/04B . . . [N: characterised by systems for checking the coolant channels, e.g. matrix systems]
- G21C17/04D . . . [N: Devices for selective sampling, e.g. valves, shutters, rotatable selector valves]
- G21C17/04F . . . [N: Detectors and metering devices for the detection of fission products]
- G21C17/04F2 [N: Precipitation chambers]
- G21C17/04F4 [N: Detection and metering circuits]
- G21C17/04H . . . [N: characterised by a special construction of fuel elements, e.g. by a confined "tracer"]

- G21C17/06 . Devices or arrangements for monitoring or testing fuel or fuel elements outside the reactor core, e.g. for burn-up, for contamination ([G21C17/08](#), [G21C17/10](#) take precedence; detecting leaking fuel elements during reactor operation [G21C17/04](#))

- G21C17/06D . . [N: Burn-up control ([G21C17/06F](#) takes precedence)]
- G21C17/06F . . [N: Control of spherical elements]
- G21C17/07 . . Leak testing
- G21C17/08 . Structural combination of reactor core or moderator structure with viewing means, e.g. with television camera, periscope, window
- G21C17/10 . Structural combination of fuel element, control rod, reactor core, or moderator structure with sensitive instruments, e.g. for measuring radioactivity, strain
- G21C17/10S . . [N: the sensitive element being part of a fuel element or a fuel assembly (structural combination with a thermoelectric element for direct production of electrical energy [G21C3/40](#))]
- G21C17/104 . . Measuring reactivity
- G21C17/108 . . Measuring reactor flux
- G21C17/112 . . Measuring temperature
- G21C17/116 . . Passages or insulators, e.g. for electric cables
- G21C17/12 . . Sensitive element forming part of control element
- G21C17/14 . Period meters
- G21C19/00** **Arrangements for treating, for handling, or for facilitating the handling of, fuel or other materials which are used within the reactor, e.g. within its pressure vessel**
- G21C19/02 . Details of handling arrangements
- G21C19/04 . . Means for controlling flow of coolant over objects being handled; Means for controlling flow of coolant through channel being serviced, [N: e.g. for preventing "blow-out"]
- G21C19/06 . . Magazines for holding fuel elements or control elements
- G21C19/06D . . . [N: Rotatable magazines]
- G21C19/07 . . . Storage racks; Storage pools
- G21C19/08 . . Means for heating fuel elements before introduction into the core; Means for heating or cooling fuel elements after removal from the core
- G21C19/10 . . Lifting devices or pulling devices adapted for co-operation with fuel elements or with control elements ([manipulators B25J](#))
- G21C19/105 . . . with grasping or spreading coupling elements
- G21C19/11 . . . with revolving coupling elements, e.g. socket coupling
- G21C19/115 . . . with latching devices and ball couplings
- G21C19/12 . . Arrangements for exerting direct hydraulic or pneumatic force on fuel element or on control element
- G21C19/14 . characterised by their adaptation for use with horizontal channels in the reactor core
- G21C19/16 . Articulated or telescopic chutes or tubes for connection to channels in the reactor core
- G21C19/18 . Apparatus for bringing fuel elements to the reactor charge area, e.g. from a storage place
- G21C19/19 . Reactor parts specifically adapted to facilitate handling, e.g. to facilitate charging or discharging of fuel elements [N1010]

- G21C19/20 . Arrangements for introducing objects into the pressure vessel; Arrangements for handling objects within the pressure vessel; Arrangements for removing objects from the pressure vessel
- G21C19/20A . . [N: Arrangements for handling ball-form, i.e. pebble fuel]
- G21C19/20B . . [N: Interchanging of fuel elements in the core, i.e. fuel shuffling]
- G21C19/20C . . [N: Assembling, maintenance or repair of reactor components ([G21C3/334](#) takes precedence)] [N1204]
- G21C19/22 . . Arrangements for obtaining access to the interior of a pressure vessel whilst the reactor is operating
- G21C19/24 . . . by using an auxiliary vessel which is temporarily sealed to the pressure vessel
- G21C19/26 . Arrangements for removing jammed or damaged fuel elements or control elements; Arrangements for moving broken parts thereof
- G21C19/28 . Arrangements for introducing fluent material into the reactor core; Arrangements for removing fluent material from the reactor core ([pumping coolant G21D](#))
- G21C19/30 . . with continuous purification of circulating fluent material, e.g. by extraction of fission products [N: deterioration or corrosion products, impurities, e.g. by cold traps ([purification of circulating fluid fuels G21C19/50](#); [separation in general B01D](#))]
- G21C19/303 . . . specially adapted for gases ([decontamination of gases G21F9/02](#))
- G21C19/307 . . . specially adapted for liquids ([decontamination of liquids G21F9/04](#))
- G21C19/31 for molten metals
- G21C19/313 using cold traps
- G21C19/317 . . . Recombination devices for radiolytic dissociation products
- G21C19/32 . Apparatus for removing radioactive objects or materials from the reactor discharge area, e.g. to a storage place; Apparatus for handling radioactive objects or materials within a storage place or removing them therefrom ([disposal of waste material G21F9/00](#))
- G21C19/34 . Apparatus or processes for dismantling nuclear fuel, e.g. before reprocessing; [N: Apparatus or processes for dismantling strings of spent fuel elements] ([shielded cells G21F7/00](#)) [C0802]
- G21C19/36 . . Mechanical means only
- G21C19/365 . . . Removing cannings or casings from fuel
- G21C19/37 by separating into pieces both the canning or the casing and the fuel element, e.g. by cutting or shearing
- G21C19/375 . . . Compacting devices, e.g. for fuel assemblies
- G21C19/38 . . Chemical means only
- G21C19/40 . Arrangements for preventing occurrence of critical conditions, e.g. during storage
- G21C19/42 . Reprocessing of irradiated fuel
- G21C19/44 . . of irradiated solid fuel
- G21C19/46 . . . Aqueous processes, [N: e.g. by using organic extraction means, including the regeneration of these means]
- G21C19/48 . . . Non-aqueous processes
- G21C19/50 . . of irradiated fluid fuel, [N: e.g. regeneration of fuels while the reactor is in operation]

- G21C21/00** **Apparatus or processes specially adapted to the manufacture of reactors or parts thereof (in general section B, e.g. B23)**
- G21C21/02 . Manufacture of fuel elements or breeder elements contained in non-active casings
- G21C21/04 . . by vibrational compaction or tamping [N: of fuel in the jacket]
- G21C21/06 . . by [N: rotatable] swaging [N: of the jacket around the fuel]
- G21C21/08 . . by a slip-fit cladding process [N: by crimping the jacket around the fuel]
- G21C21/10 . . by extrusion, drawing, or stretching [N: by rolling, e.g. "picture frame" technique]
- G21C21/12 . . by hydrostatic or thermo-pneumatic canning [N: in general by pressing without lengthening, e.g. explosive coating]
- G21C21/14 . . by plating [N: the fuel] in a fluid
- G21C21/16 . . by casting or dipping techniques
- G21C21/18 . . Manufacture of control elements covered by group [G21C7/00](#)
- G21C23/00** **Adaptations of reactors to facilitate experimentation or irradiation [N1010]**