

Annex A — DICOM Conformance Statement

This annex states the DICOM conformance of RadContour 1.1 **as built**. It follows the structure of a conventional DICOM Conformance Statement so it can be compared side by side with the conformance statement of a PACS or treatment planning system.

Scope and intent

DICOM adherence by itself does not guarantee interoperability. This document supports a first-level comparison; it does not replace validation testing against the specific systems you intend to connect. RadContour is a research, education and training tool and is not a certified medical device. Data exchanged with it must not be used for clinical treatment without independent verification.

A.1 Overview

The following DICOM services are supported for receiving and sending imaging and radiotherapy data.

SOP Class Name	SOP Class UID	Provider of Service (SCP)	User of Service (SCU)
Verification	1.2.840.10008.1.1	Yes	Yes
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	Yes	Yes
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	Yes	Yes
PET Image Storage	1.2.840.10008.5.1.4.1.1.128	Yes	Yes
Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.1	Yes	Yes
RT Structure Set Storage	1.2.840.10008.5.1.4.1.1.481.3	Yes	Yes
RT Dose Storage	1.2.840.10008.5.1.4.1.1.481.2	Yes	Yes
RT Plan Storage	1.2.840.10008.5.1.4.1.1.481.5	Yes	Yes
Study Root Query/Retrieve Information Model — FIND	1.2.840.10008.5.1.4.1.2.2.1	No	Yes
Study Root Query/Retrieve Information Model — GET	1.2.840.10008.5.1.4.1.2.2.3	No	Yes
Study Root Query/Retrieve Information Model — MOVE	1.2.840.10008.5.1.4.1.2.2.2	No	No
Patient Root Query/Retrieve Information Model (all)	1.2.840.10008.5.1.4.1.2.1.x	No	No
Deformable Spatial Registration Storage	1.2.840.10008.5.1.4.1.1.66.3	No	No

Query and retrieve are supported at STUDY level only. Deformable Spatial Registration objects are explicitly rejected on import.

A.2 Introduction

A.2.1 Revision history

Date	Version	Comment
2026-07-18	1.0	First version. Describes RadContour 1.0.
2026-08-20	1.1	Describes RadContour 1.1. DICOM networking becomes part of the RadContour Pro subscription. Receiver gains a Calling-AE / source-address allowlist. Open and point contour geometry is retained on import instead of discarded. (0018,1020) Software Versions now tracks the installed version. M-series requirement corrected to apply to AI auto-contouring only.

A.2.2 Remarks

This annex is written for those responsible for imaging network policy and architecture, and for integrators connecting RadContour to other DICOM systems. It documents behaviour as implemented, including deliberate restrictions and known deviations, so that integration problems can be predicted rather than discovered.

A.3 Networking

A.3.1 Implementation model

RadContour comprises a **single DICOM Application Entity** that acts as both an SCU and a Storage SCP. Unlike a server-based planning system, the Storage SCP is embedded in the application rather than being a standalone service, and therefore runs only while the application is in the foreground. See the Application Data Flow Diagram in §1.1.

A.3.1.1 Functional definition of the Application Entity

- As **SCU** it initiates associations to verify a remote node (C-ECHO), to query it (C-FIND), to retrieve studies (C-GET), and to send objects (C-STORE).
- As **SCP** it accepts associations for Verification and Storage, validates each incoming object by parsing it before it is written to disk, and imports it into the patient library.
- Inbound associations are filtered by a configurable peer allowlist (*Accept only from configured nodes*, default enabled): the **Calling AE Title** or the source address must match a configured remote node. The **Called AE Title** is **not** validated, and there is no user-level access control, TLS or credential exchange. See A.4.

A.3.1.2 Association parameters

Parameter	Value
Application Context Name	1.2.840.10008.3.1.1.1
Maximum PDU length proposed / accepted	16384 bytes
Maximum inbound PDU accepted before the association is aborted	8 MiB
Connect timeout	8 seconds
Read timeout	30 seconds
Outbound fragmentation chunk	max(1024, peer max PDU – 12) bytes
Default AE Title	RADCONTOUR
Default listening port	11112 (must be ≥ 1024 ; iOS forbids privileged ports)

A.3.2 Transfer syntax

Transfer Syntax Name	UID	Read	Write
Implicit VR Little Endian	1.2.840.10008.1.2	Yes	No
Explicit VR Little Endian	1.2.840.10008.1.2.1	Yes	Yes
Deflated Explicit VR Little Endian	1.2.840.10008.1.2.1.99	No	No
Explicit VR Big Endian	1.2.840.10008.1.2.2	No	No
JPEG / JPEG-LS / JPEG 2000 (all)	1.2.840.10008.1.2.4.x	No	No
RLE Lossless	1.2.840.10008.1.2.5	No	No

- All objects are written in **Explicit VR Little Endian** with known-length sequences (no undefined-length sequence delimiters).
- On association the SCP prefers Explicit VR LE and falls back to Implicit VR LE.
- C-FIND identifiers are proposed as **Implicit VR LE only**.
- C-STORE as SCU proposes only the transfer syntax the source object already uses. RadContour **does not transcode**: an instance whose syntax the peer does not accept is skipped and counted as failed.

A.3.3 Importing data

Three sources are supported: a folder selected in the Files app, Query/Retrieve from a configured remote node, and objects pushed to the built-in Storage SCP. Imported CT, MR and PET datasets are stored unmodified. Query/Retrieve is Study Root, STUDY level; universal matching is refused — at least one of Patient ID, Patient Name or Study Date must be supplied.

C-FIND request/response keys used: (0008,0052) Query/Retrieve Level, (0010,0010) Patient's Name, (0010,0020) Patient ID, (0010,0030) Patient's Birth Date, (0010,0040) Patient's Sex, (0008,0020) Study Date, (0008,1030) Study Description, (0020,000D) Study Instance UID, (0008,0061) Modalities in Study, (0020,1208) Number of Study Related Instances.

A.3.4 Exporting data

Two targets are supported: a folder in the Files app, and a configured remote node via C-STORE. Objects that may be exported are the image sets, the working RT Structure Set, imported RT Structure Sets, Spatial Registration, RT Plan and RT Dose.

A.3.4.1 Generated UIDs and implementation identity

New SOP Instance and Series Instance UIDs are generated under the UUID-derived root **2.25** (ISO/IEC 9834-8), i.e. 2.25.<128-bit UUID as decimal>. Study Instance UID and Frame of Reference UID are inherited from the source image set so that exported objects remain correctly associated.

Item	Value
Generated UID root	2.25. (UUID-derived; no organisational root is registered)
Implementation Class UID — network associations	1.2.826.0.1.3680043.10.1338.1
Implementation Class UID — file export (0002,0012)	2.25.245821456732001601
Implementation Version Name — network	RADCONTOUR_0_2
Implementation Version Name — file export (0002,0013)	RADCONTOUR0_2

Known deviation — implementation identity is not uniform

The Implementation Class UID and Implementation Version Name differ between the network path and the file-export path, as tabulated above. Both values are stated here because both occur in practice. Receiving systems that key on implementation identity may therefore see two distinct identities from the same product. This is a defect and is expected to be unified in a future release.

A.3.4.2 De-identification

An optional de-identification pass may be applied on export. It is **not** a validated implementation of the DICOM Basic Application Level Confidentiality Profile; the behaviour is as follows.

Action	Attributes
Replaced with supplied values	(0010,0010) Patient's Name → ANONYMOUS · (0010,0020) Patient ID → ANON · (0010,0030) Patient's Birth Date → current date · (0010,0040) Patient's Sex → O
Removed	All other group (0010) elements · all odd (private) groups · all group-length (gggg,0000) elements · groups (0032) and (0038) in full · institution, physician, operator and request/scheduling attributes including (0008,0080), (0008,0081), (0008,0090), (0008,1010), (0008,1040)–(0008,1084), (0018,1000), (0040,xxxx) request attributes
Emptied (zero length, attribute retained)	Creation and study/series date-time attributes (0008,0012)–(0008,0035), (0008,0050) Accession Number, (0008,1030) Study Description, (0008,103E) Series Description, (0040,0002)–(0040,0251) scheduling attributes
Retained unchanged	UIDs (SOP, Study, Series, Frame of Reference), File Meta group (0002), Pixel Data (7FE0,0010), and all other attributes

Limitations of de-identification

- UIDs are retained **by design** so that exported objects still reference each other. The dataset therefore remains linkable to the original study.
- ROI names, retained descriptions and any text **burned into pixel data are NOT scrubbed**.
- De-identification **fails closed**: if a dataset cannot be processed (Big Endian or Deflated transfer syntax, or a structural inconsistency), the object is skipped rather than exported identifiable.

A.4 Security

- **No security profiles are supported.** There is no TLS, no certificate handling and no encryption of DICOM traffic — all associations are plaintext TCP.
- The Storage SCP applies a **configurable peer allowlist** (*Accept only from configured nodes*, default enabled): an association is accepted only when the **Calling AE Title** or the **source address** matches a configured remote node; otherwise it is rejected with an A-ASSOCIATE-RJ (result 1 — rejected-permanent, source 1 — DICOM UL service-user, reason 3 — calling-AE-title-not-recognized). The **Called AE Title** is **not** validated, and the allowlist is not authentication: AE Titles are sender-asserted and spoofable. With the setting disabled, associations are accepted from any host that can reach the listening port.
- The Storage SCP is available **only while the application is in the foreground**, so RadContour is not suitable as a standing auto-route destination.
- Patient data is held in the application's private container on the device; only the encrypted diagnostic log — which contains no patient data — is exposed to the Files app. That log records the signed-in **username and role** on every line.
- Deployment must therefore rely on **network-level controls**: a hospital-managed segment, restricted subnet or VLAN, and firewall rules limiting the listening port to the intended PACS.

A.5 Support of character sets

All generated objects declare (0008,0005) Specific Character Set = **ISO_IR 192 (UTF-8)**. This is not configurable. On import the following is applied:

Declared (0008,0005)	Handling
ISO_IR 192	Decoded as UTF-8, falling back to ISO-8859-1
ISO_IR 100	Decoded as ISO-8859-1 (Latin-1)
Absent or any other value	Decoded as UTF-8, falling back to ISO-8859-1

Character set limitations

- ISO 2022 code extensions and multi-byte repertoires (for example ISO_IR 144 Cyrillic, or Japanese character sets) are **not supported**. Such text is mis-decoded rather than rejected.
- Specific Character Set is **not inherited into sequence items**, so an item without its own (0008,0005) is decoded using the default rule. Non-Latin ROI names may therefore display incorrectly.

A.6 Known issues and limitations

A.6.1 Services

- **C-MOVE is not implemented in either direction.** RadContour can act as the destination of a C-MOVE initiated by a PACS (it simply receives the resulting C-STOREs), but it never issues one.
- **Patient Root query/retrieve is not supported.** Study Root only, STUDY level only — there is no series or image level query, drill-down or retrieve.
- Storage Commitment, MPPS, DICOMDIR and media interchange are not supported.

A.6.2 Object and pixel handling

- **Enhanced multi-frame image IODs are not supported.** Multi-frame CT, MR and PET are not detected or rejected — only the first frame is read. Multi-frame handling is implemented for RT Dose only.
- Images must have Samples per Pixel = 1 and Bits Allocated = 16; other values are rejected. RT Dose accepts Bits Allocated 16 or 32.
- **(0018,0050) Slice Thickness and (0018,0088) Spacing Between Slices are not read.** Slice spacing is derived from consecutive Image Position (Patient) values.
- **All contour geometric types are imported and retained**, but only **CLOSED_PLANAR** bounds a fillable region and reaches the voxel mask. OPEN_PLANAR, OPEN_NONPLANAR and POINT contours — brachytherapy applicator and catheter paths, seed positions — are carried through the model but are **not rasterized and not displayed** in this release. An ROI holding only such contours is therefore listed as having no contoured volume. Up to 1.0 these were discarded on import, which silently lost the data.
- **Deformable Spatial Registration is rejected.** Of rigid registrations, only matrices of type RIGID that pass an orthonormality and determinant check are applied; AFFINE and RIGID_SCALE are skipped.
- A **non-uniform Grid Frame Offset Vector** is accepted with a warning and approximated by the average frame spacing, because the internal dose grid is a uniform affine grid.
- (3004,0005) Spatial Transform of Dose and (3004,0002) Dose Units are read and retained but are **not acted upon**; a dose declared as RELATIVE is not converted.

A.6.3 Deviations in generated objects

- **(0008,0090) Referring Physician's Name is written with VR `LO` instead of `PN`.** Strict validators will flag this.
- **(3006,0036) ROI Generation Algorithm is always written as `MANUAL`**, including for ROIs produced by the on-device automatic segmentation. Systems that rely on this attribute to identify AI-generated contours will not be able to distinguish them.
- (0008,0020) Study Date on an exported RT Structure Set is the **export date** rather than the source study date; on generated RT Dose and RT Plan it is written empty.
- Exported RT Structure Sets are always marked (300E,0002) Approval Status = **UNAPPROVED**.

A.6.4 Interoperability measures for strict receivers

The following are implemented deliberately because strict receivers (for example DCMTK and Orthanc) otherwise abort the transfer:

- Elements are written in **strictly ascending tag order** (PS3.5 §7.4). In particular (3006,0084) Referenced ROI Number is emitted *after* (3006,0040) Contour Sequence.

- Contours are **simplified** with a Ramer–Douglas–Peucker tolerance of 0.03 mm, reducing point counts by roughly a factor of 15 while changing enclosed volume by less than 0.3 %. Without this, large structures such as body or couch produce multi-megabyte objects that strict receivers fail to parse mid-stream.
- Because Explicit VR short value fields carry a 16-bit length, (3006,0050) Contour Data is kept at or below **65534 bytes**; an over-long contour is progressively decimated and (3006,0046) is kept consistent.

A.7 IOD definitions — import

Only the attributes listed below are read. All other attributes present in a received object are ignored for interpretation, though they are preserved byte-for-byte when an imported object is re-exported.

A.7.1 CT / MR / PET Image

Attribute name	Tag	Type	Comment
Patient's Name	(0010,0010)	2	Patient identity; PN components split for display
Patient ID	(0010,0020)	2	Patient identity; empty value becomes UNKNOWN
Patient's Birth Date	(0010,0030)	2	Patient identity
Patient's Sex	(0010,0040)	2	Patient identity
Study Instance UID	(0020,000D)	1	Study grouping; absent becomes UNKNOWN-STUDY
Study Date	(0008,0020)	2	Library display only
Study Description	(0008,1030)	3	Library display only
Series Instance UID	(0020,000E)	1	Series grouping
Series Description	(0008,103E)	3	Display; reused as Structure Set Name on export
Modality	(0008,0060)	1	Determines referenced image SOP class on export
SOP Instance UID	(0008,0018)	1	Per-slice reference in Contour Image Sequence
Instance Number	(0020,0013)	2	Tertiary sort key
Frame of Reference UID	(0020,0052)	1	Registration and RT object association
Image Position (Patient)	(0020,0032)	1	Slice origin; primary sort key by projection on the normal
Image Orientation (Patient)	(0020,0037)	1	Direction cosines
Pixel Spacing	(0028,0030)	1	Row and column spacing
Rows / Columns	(0028,0010) / (0028,0011)	1	Required; each must be 1...8192
Samples per Pixel	(0028,0002)	1	Must be 1
Bits Allocated	(0028,0100)	1	Must be 16

Bits Stored	(0028,0101)	1	Drives sign extension and masking
Pixel Representation	(0028,0103)	1	Signedness
Photometric Interpretation	(0028,0004)	1	Advisory only; non-MONOCHROME warns but is accepted
Rescale Slope / Intercept	(0028,1053) / (0028,1052)	1	Conversion to Hounsfield units
Window Center / Width	(0028,1050) / (0028,1051)	3	Initial display; defaults 40 / 400 if absent
Pixel Padding Value	(0028,0120)	3	Excluded from automatic windowing
Pixel Data	(7FE0,0010)	1	Required; uncompressed only

A.7.2 RT Structure Set

Attribute name	Tag	Type	Comment
Structure Set Label	(3006,0002)	1	Library node label
Structure Set Name	(3006,0004)	3	Fallback label
Referenced Frame of Reference Sequence	(3006,0010)	3	Traversed to resolve the referenced series
> RT Referenced Study Sequence	(3006,0012)	3	
>> RT Referenced Series Sequence	(3006,0014)	3	Series Instance UID (0020,000E) read from here
Structure Set ROI Sequence	(3006,0020)	1	Iterated for ROI identity
> ROI Number	(3006,0022)	1	Key linking the three sequences
> ROI Name	(3006,0026)	2	Display name; absent becomes "ROI n"
ROI Contour Sequence	(3006,0039)	1	Iterated per ROI
> ROI Display Color	(3006,002A)	3	RGB; absent uses a default colour
> Referenced ROI Number	(3006,0084)	1	Link to Structure Set ROI Sequence
> Contour Sequence	(3006,0040)	3	
>> Contour Geometric Type	(3006,0042)	1	All values imported and retained; only CLOSED_PLANAR is

			rasterized; absent assumed CLOSED_PLANAR
>> Contour Data	(3006,0050)	1	x\y\z triplets in mm; at least two points required
>> Contour Image Sequence	(3006,0016)	3	First item only; (0008,1155) used for slice association
RT ROI Observations Sequence	(3006,0080)	1	Iterated for interpreted type
> RT ROI Interpreted Type	(3006,00A4)	2	Maps to the ROI category (EXTERNAL, ORGAN, PTV, ...)

Not read: (3006,0046) Number of Contour Points (derived from Contour Data length), (3006,0036) ROI Generation Algorithm, (3006,0085) ROI Observation Label, (3006,00B0) ROI Physical Properties Sequence, (300E,0002) Approval Status. Unresolved image references produce a warning, never a rejection.

A.7.3 RT Dose

Attribute name	Tag	Type	Comment
Rows / Columns	(0028,0010) / (0028,0011)	1	Required; each 1...8192
Number of Frames	(0028,0008)	1	Default 1; maximum 4096; total voxels capped at 2 ²⁷
Bits Allocated / Stored	(0028,0100) / (0028,0101)	1	Bits Allocated must be 16 or 32
Pixel Representation	(0028,0103)	1	Signed dose warns but is accepted
Samples per Pixel	(0028,0002)	1	Must be 1
Image Position (Patient)	(0020,0032)	1	Required, exactly 3 values
Image Orientation (Patient)	(0020,0037)	1	Required, exactly 6 values
Pixel Spacing	(0028,0030)	1	Required, exactly 2 values
Grid Frame Offset Vector	(3004,000C)	1C	Frame spacing; non- uniform accepted with a warning and averaged
Dose Grid Scaling	(3004,000E)	1	Multiplier to Gy; default 1.0
Dose Units	(3004,0002)	1	Non-GY warns; value is retained but no conversion is applied
Dose Type	(3004,0004)	1	Non-PHYSICAL warns only

Dose Summation Type	(3004,000A)	1	Drives per-fraction to total scaling
Dose Comment	(3004,0006)	3	Node label
Spatial Transform of Dose	(3004,0005)	3	Retained but not acted upon
Frame of Reference UID	(0020,0052)	1	Grid registration to the image set
Referenced RT Plan Sequence	(300C,0002)	1C	(0008,1155) links the dose to its plan
Pixel Data	(7FE0,0010)	1	Required

A.7.4 RT Plan

Metadata only — beam geometry, MLC and patient setup are not read.

Attribute name	Tag	Type	Comment
RT Plan Label	(300A,0002)	1	Display label
Dose Reference Sequence	(300A,0010)	3	Scanned for the prescription
> Target Prescription Dose	(300A,0026)	3	First positive value is used
Fraction Group Sequence	(300A,0070)	1	First item only
> Number of Fractions Planned	(300A,0078)	2	Fraction count
> Referenced Beam Sequence	(300C,0004)	3	Fallback path only
>> Beam Dose	(300A,0084)	3	Fallback prescription = Σ Beam Dose $\times$ fractions
SOP Instance UID	(0008,0018)	1	Allows an RT Dose to be matched to its plan

A.7.5 Spatial Registration

Attribute name	Tag	Type	Comment
SOP Class UID	(0008,0016)	1	Deformable Spatial Registration (...66.3) is rejected
Registration Sequence	(0070,0308)	1	Required and non-empty
> Frame of Reference UID	(0020,0052)	1	Required per item
> Matrix Registration Sequence	(0070,0309)	1	
>> Matrix Sequence	(0070,030A)	1	

>>> Frame of Reference Transformation Matrix Type	(0070,030C)	1	Only RIGID applied; absent leniently treated as RIGID
>>> Frame of Reference Transformation Matrix	(3006,00C6)	1	Exactly 16 values, row-major; validated for orthonormality and determinant +1

A.8 IOD definitions — export

A.8.1 RT Structure Set

File Meta: (0002,0002) Media Storage SOP Class UID = 1.2.840.10008.5.1.4.1.1.481.3, (0002,0010) Transfer Syntax UID = 1.2.840.10008.1.2.1.

Attribute name	Tag	Type	Value written
Specific Character Set	(0008,0005)	1C	ISO_IR 192
Instance Creation Date / Time	(0008,0012) / (0008,0013)	3	Time of export
SOP Class UID	(0008,0016)	1	1.2.840.10008.5.1.4.1.1.481.3
SOP Instance UID	(0008,0018)	1	Newly generated under 2.25
Study Date / Time	(0008,0020) / (0008,0030)	2	Export date and time (see A.6.3)
Accession Number	(0008,0050)	2	Empty
Modality	(0008,0060)	1	RTSTRUCT
Manufacturer	(0008,0070)	2	RadContour
Referring Physician's Name	(0008,0090)	2	Empty (written with VR LO — see A.6.3)
Series Description	(0008,103E)	3	RadContour RTStruct
Manufacturer's Model Name	(0008,1090)	3	RadContour
Patient's Name / ID / Birth Date / Sex	(0010,0010) ... (0010,0040)	2	From the source image set, or the de-identified values
Software Versions	(0018,1020)	3	RadContour <version> — tracks the installed app, e.g. RadContour 1.1
Study Instance UID	(0020,000D)	1	Copied from the referenced image set
Series Instance UID	(0020,000E)	1	Newly generated
Study ID	(0020,0010)	2	1
Series Number	(0020,0011)	2	1
Instance Number	(0020,0013)	3	1
Frame of Reference UID	(0020,0052)	1	Copied from the referenced image set
Structure Set Label	(3006,0002)	1	RadContour RTS
Structure Set Name	(3006,0004)	3	Image set / series description / set name
Structure Set Description	(3006,0006)	3	RadContour Contour

Structure Set Date / Time	(3006,0008) / (3006,0009)	2	Time of export
Referenced Frame of Reference Sequence	(3006,0010)	3	One item; contains the full study/series/image reference tree
Structure Set ROI Sequence	(3006,0020)	1	One item per ROI
> ROI Number	(3006,0022)	1	1-based index
> Referenced Frame of Reference UID	(3006,0024)	1	Frame of Reference UID
> ROI Name	(3006,0026)	2	User-entered structure name
> ROI Generation Algorithm	(3006,0036)	2	MANUAL (always — see A.6.3)
ROI Contour Sequence	(3006,0039)	1	One item per ROI
> ROI Display Color	(3006,002A)	3	r\g\b
> Contour Sequence	(3006,0040)	3	One item per contour
>> Contour Image Sequence	(3006,0016)	3	Referenced slice SOP class and instance
>> Contour Geometric Type	(3006,0042)	1	CLOSED_PLANAR
>> Number of Contour Points	(3006,0046)	1	Consistent with Contour Data
>> Contour Data	(3006,0050)	1	Simplified polygon, %.4f per coordinate, ≤ 65534 bytes
> Referenced ROI Number	(3006,0084)	1	Emitted after Contour Sequence to preserve tag order
RT ROI Observations Sequence	(3006,0080)	1	One item per ROI
> Observation Number	(3006,0082)	1	1-based
> Referenced ROI Number	(3006,0084)	1	1-based
> ROI Observation Label	(3006,0085)	3	Structure name truncated to 16 characters
> RT ROI Interpreted Type	(3006,00A4)	3	EXTERNAL / ORGAN / SUPPORT / GTV / CTV / PTV / NONE
> ROI Interpreter	(3006,00A6)	2	Empty
Approval Status	(300E,0002)	1	UNAPPROVED

A.8.2 Spatial Registration

Attribute name	Tag	Type	Value written
SOP Class UID	(0008,0016)	1	1.2.840.10008.5.1.4.1.1.66.1
Content Date / Time	(0008,0023) / (0008,0033)	1	Time of export
Modality	(0008,0060)	1	REG
Series Description	(0008,103E)	3	RadContour: <registration name>
Referenced Series Sequence	(0008,1115)	1C	Reference series and its instances
Studies Containing Other Referenced Instances Sequence	(0008,1200)	1C	Written only when the floating study differs
Frame of Reference UID	(0020,0052)	1	Reference frame of reference
Content Label	(0070,0080)	1	REGISTRATION
Content Description	(0070,0081)	2	User registration name
Content Creator's Name	(0070,0084)	2	RadContour
Registration Sequence	(0070,0308)	1	Exactly two items: reference (identity) and floating
> Matrix Registration Sequence	(0070,0309)	1	
>> Matrix Sequence	(0070,030A)	1	
>>> Frame of Reference Transformation Matrix Type	(0070,030C)	1	RIGID
>>> Frame of Reference Transformation Matrix	(3006,00C6)	1	16 values, row-major, %.6g
> Registration Type Code Sequence	(0070,030D)	3	125021 Frame of Reference Identity (item 1); 125024 Image Content-based Alignment (item 2)

A.8.3 Generated RT Dose and RT Plan (dose summation)

Summing doses creates a new RT Dose ("RT Dose_Sum") and a companion RT Plan ("RT Plan_Sum"). The plan is a derivation vehicle carrying the prescription and fraction count; it contains no beams and is **not a deliverable plan**.

Attribute name	Tag	Value written
Modality	(0008,0060)	RTDOSE / RTPLAN
Series Description	(0008,103E)	RT Dose_Sum / RT Plan_Sum
Series Number	(0020,0011)	90 (dose) / 91 (plan)

Slice Thickness	(0018,0050)	Absolute frame spacing
Photometric Interpretation	(0028,0004)	MONOCHROME2
Bits Allocated / Stored / High Bit	(0028,0100) / (0101) / (0102)	16 / 16 / 15, unsigned
Frame Increment Pointer	(0028,0009)	(3004,000C)
Dose Units / Dose Type	(3004,0002) / (3004,0004)	GY / PHYSICAL
Dose Summation Type	(3004,000A)	PLAN (the grid is already a total dose)
Grid Frame Offset Vector	(3004,000C)	Uniform, $i \times$ frame spacing
Dose Grid Scaling	(3004,000E)	maximum dose / 65535
Referenced RT Plan Sequence	(300C,0002)	References the companion RT Plan_Sum
RT Plan Geometry	(300A,000C)	TREATMENT_DEVICE
Number of Beams	(300A,0080)	0
Target Prescription Dose	(300A,0026)	Summed prescription in Gy
Number of Fractions Planned	(300A,0078)	Total fractions