GS1 IRELAND · DIGITAL CONTINUITY

From mill to melt: design intent that never breaks

How EPCIS 2.0 events and GS1 Digital Link carry the fully compliant, signed-off design intent along the nine-step Digital Continuity Spine, from the steel mill, through Midland Steel's FasterFix cage, to recovery and re-melting.

THE JOURNEY: EVERY HAND-OFF IS AN EPCIS 2.0 EVENT

1 EAF mill

Spine Steps 4–5

Scrap is melted into a new heat; each bar carries its GTIN and heat number.

`TransformationEvent` **Scan shows:** mill certificate, EPD and DPP

✓ **Grade and carbon match the DAI**

2 FasterFix cage, Portlaoise

Spine Step 5

Midland Steel welds the bars into one cage and tags it with a Digital Link resolver-enabled serialised GTIN.

`AggregationEvent · assembling` **Scan shows:** 3D module and bar schedule

✓ **Shapes, marks and cover as approved**

3 Despatch

Spine Step 5

The cage leaves the fabricator's GLN for the site GLN.

`ObjectEvent · shipping` **Scan shows:** delivery note and transport carbon

✓ **Right cage, correct delivery point on site**

4 Site gate

Spine Step 6

Scanned on the truck, before unloading.

`ObjectEvent · receiving` **Scan shows:** expected against delivered

✓ **Serial matches the DAI** ⚑ **If not, a RED FLAG alert is raised**

5 Installation

Spine Step 6

The cage is lifted into position and checked using the specifications and SOPs surfaced by the scan.

`ObjectEvent · installing` **Scan shows:** position, cover, SOP and RAMS

✓ **Resident engineer approves the pour**

6 Concrete pour

Spine Step 6

The right mix is placed; slump tested, cubes cast and tracked.

`ObjectEvent · inspecting` **Scan of the cage S-GTIN, temporarily mapped to the permanent GIAI on each formwork panel, shows:** spec, test results, NEC4 early warnings

✓ **Mix and strength meet the spec**

7 Hand-over

Spine Step 7

The evidence pack, including cube and slump results, assembles itself; the DAI becomes the GIAI, mapped to the GLN and listed in the DBL.

`ObjectEvent · accepting` **Scan shows:** the complete as-built record

✓ **Nothing missing at hand-over**

8 In use

Spine Step 8

The Digital Building Logbook, as proven by openDBL, holds every test result and inspection.

`ObjectEvent · inspecting` **Scan shows:** grade, heat, cover and history

✓ **Condition tracked for life**

9 Removal

Spine Step 9

The rebar cage's grade and origin are known before extraction, so the benefits of recovery can be weighed against its cost.

`ObjectEvent · disassembling` **Scan shows:** demolition precautions and route

✓ **Steel sent to reuse or EAF**

10 Melt

Spine Step 9

Recovered steel becomes a new heat at an EAF mill.

`TransformationEvent` **Scan shows:** recycled content for the next EPD

✓ **Provenance survives the melt**

↺ **The new heat starts the next bar's journey, with its recycled content proven.**

THE DESIGN INTENT

Fixed once, on the DAI

Approved at spine step 2, before any product exists

Bar	20 mm B500C, EAF route
Cover	50 mm earth faces, 40 mm exposed
Concrete	C32/40, 50% GGBS
Carbon	Target from the product EPDs
Signed off	Structural engineer of record, by GSRN (role and firm)
Identity	DAI-RW01-E04, then the cage's serialised GTIN, then its GIAI

What EPCIS 2.0 adds

What GTIN, serial, heat	**Where** GLN	**When** Event time
Why Business step	**How** Sensor and test data	**Who** GSRN: role, not person

- Aggregation and transformation events follow bars into a cage, and scrap into a new heat.
- Each event is compared with the DAI. People act only on exceptions.
- Open JSON-LD over REST: mill, fabricator, contractor, owner and recycler read the same record.
- GLN-to-GLN legs give Scope 3 transport carbon as primary data.

What Digital Link adds

- One QR code on the cage tag, readable by any phone.
- Resolves the GTIN and serial to the DPP, certificates, EPD and instructions.
- Each actor scans their GSRN first, then sees only their role's view.
- The same code still works for the demolition engineer, decades later.

Intent fixed once

Grade, cover, mix and carbon are approved on the DAI and never re-keyed.

Checked at every hand-off

Every scan is an EPCIS 2.0 event tested against the DAI. Only deviations need a person.

Proven at the melt

The transformation event links old heat to new, so recycled content is evidence, not estimate.

Illustrative example. GTINs, GLNs and GSRNs are examples, not allocated keys. The DAI is a proposed design-stage identifier awaiting standardisation. FasterFix is Midland Steel's off-site cage approach.

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