Supplementary Information

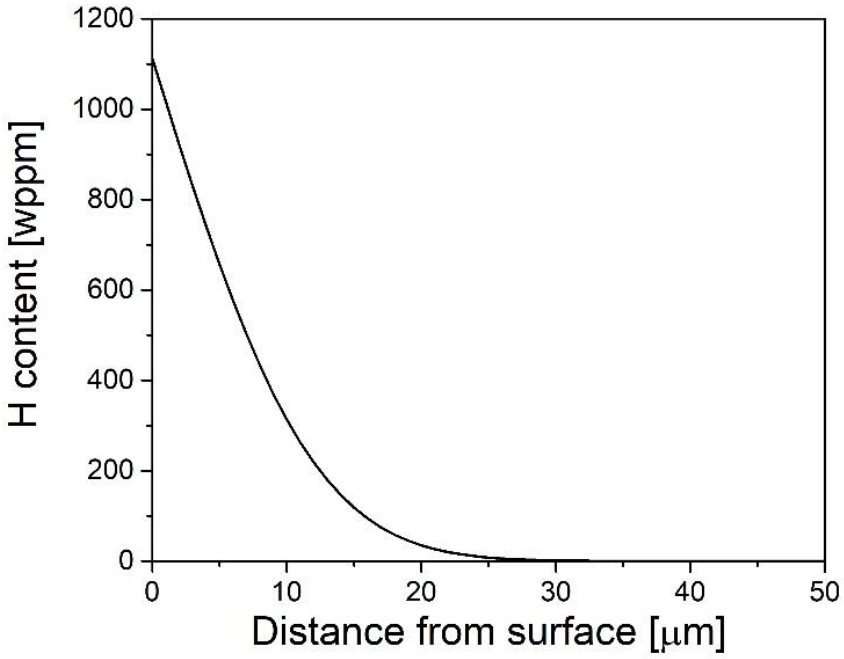

Fig. S1. An example of the hydrogen concentration gradient in an electrochemically charged FCC alloy (estimated following Eqs. (1) and (2) with the assumptions; D_H of 316L steel [34] and w and C_M from our study (1 mm and 18.23 wppm respectively).

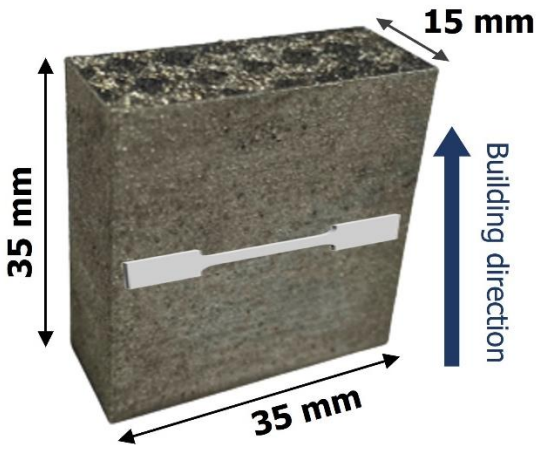

Fig. S2. Representative image of the as-built sample where the tensile direction is added.

Table S1. Summary of TDS conditions, activation energies, and trapping sites in the literatures.

Structure	Composition	Heating rate [°C/h]	Peak temperature [°C]	E_a [kJ/mol]	Trapping site	Ref.
FCC	Pure Al	600	250	15.3	Lattice	[83]
			400	43.5	Dislocation	
			520	84.8	Vacancy	
	Pure Ni	13800	320	19.2	Lattice	[94]
			570	33.6	Dislocation	
			820	54.7	Vacancy	
	AlMgCrZr	300	190	16.8	Lattice	[95]
			310	33.5	Dislocation	
			510	64.9	Vacancy	
	NiFeCr	300	170	12.7	Lattice	[96]
			360	21.5	Dislocation	
			520	49.5	Vacancy	
	AlZnMgCu	300	140	20.9	Lattice	[97]
			230	37.6	Dislocation	
			350	62.3	Grain boundary	
	316L	7200	400	32	Dislocation	[98]
			420	43	Grain boundary	
	AM CoCrFeNi	200	105	23.6	Lattice	This study
			150	45.3	Dislocation	
			200	62.3	Vacancy	
BCC	Pure Fe	180	378	17.2	Grain boundary	[82]
			471	26.8	Dislocation	
			540	35.2	Microvoid	