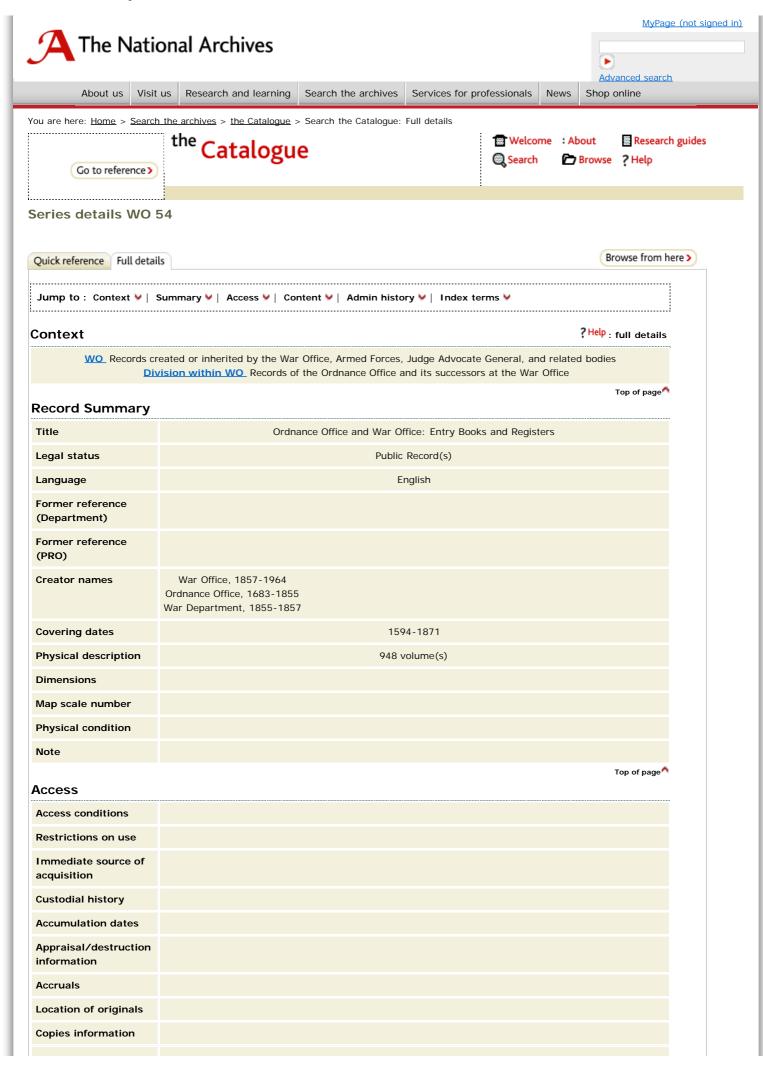


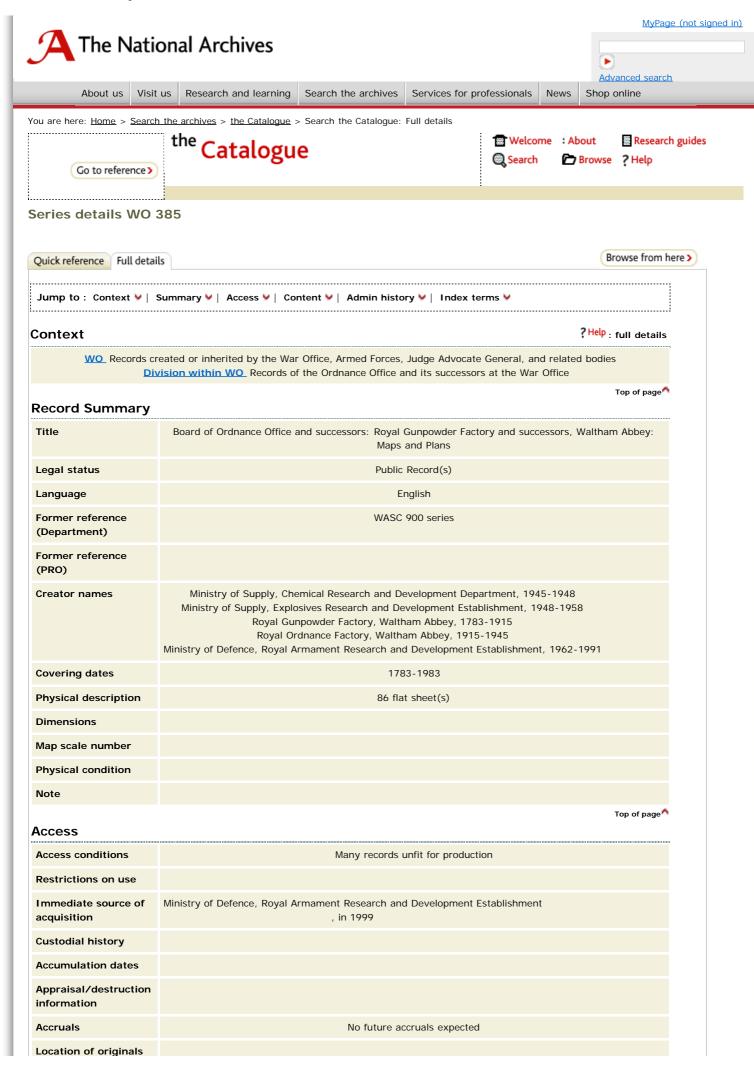
	• Roya • (• P	 Army Ordnance Corps, WO 111 ers, demolition of the fortifications at al Engineers, Sheerness, letter book, Director of Artillery, WO 196 Chemical Inspection Department, WO Personnel and Office Management, WO sowder Factory and successors, WO 3 	<u>278</u> <u>2381</u>
Arrangement			
Publication note			
Unpublished finding aids			
Related material	second Earl of Chatham, as Mast Univer	oply Officers' Committee see: Correspondenter General of the Ordnance from 1801 to 1 points of the Ordnance (English MS 1271) of the CAB 60 of SUPP 3 of Munitions and successors, including George: MUN	806, are in the John Rylands
Separated material	Further misc Ge Records of service See a	ans of fortifications, etc are in: WORK 43 WO 78 and Division within SUPP cellanous Ordnance Office records are in PR eneral Orders, 1805-1857, are in WO 123 e of the Royal Artillery and Royal Engineers also Ministry of Supply Division within SUPP hers for agent's disbursements are in WO 13	are in <u>WO 69</u>
Admin History			Top of page [♠]
Administrative / biographical background	them an Ordnance Office was gra also a separate Armoury Offi- lieutenant of the Ordnance, sur century the titles of master g	of the Ordnance first appear early in the fift adually established at the Tower of London, ice. A reform of the Ordnance Office in 1543 rveyor, storekeeper and clerk of deliveries. I general and lieutenant general began to reply office was abolished and its duties transfe	where from 1429 there was added the offices of the arrow the early seventeenth ace those of master and
			Top of page [♠]
ndex terms			
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Corporate names Personal names			
Personal names Places			
Personal names	weapons munitions production		
Personal names	·		Top of page [▲]
Personal names Places	·		Top of page [∧] Catalogu
Personal names Places Subjects	munitions production	About us	
Personal names Places	·	About us Jobs and careers	Catalogu
Personal names Places Subjects Getting in touch	munitions production Site help		Catalogu
Personal names Places Subjects Getting in touch Contact us	Site help Help index	Jobs and careers	Catalogu



cone and content	
cope and content	Entry books and registers of the Ordnance Office including:
	Quarterly lists of salaries, pensions, etc of the civil and military establishment and artificers, 1594 to 1837.
	Lists of civil and military establishments at home and abroad, 1676 to 1855, including some lists of the Irish Ordnance establishment, returns of Ordnance medical officers, 1835 to 1850, and lists of Artillery and Engineer officers, 1851 and 1855.
	Entry books of commissions of master gunners, 1740 to 1772, and of Artillery and Engineer officers, including foreign corps, 1794 to 1851.
	Returns of Engineer officers,1786 to 1850.
	Description books for men of the Artillery and for sappers, miners, artificers, labourers, etc, 1755 to 1863.
	Entry books of discharges, deaths, transfers, etc, 1740 to 1859, chiefly from the Artillery, but including some from the Engineers.
	Registers of pensions, military and civil, 1802 to 1844, including widows' pensions and some registers of salaries and pensions of the Barrack Office.
	Registers of letters of attorney of civil and military officers, 1699 to 1857.
	Returns of persons employed, 1811 to 1847.
	Miscellaneous registers, pay lists, etc, of the Artillery and Engineers, 1692 to 1871, including French Emigrant Engineers and Artillery, 1795 to 1802, Field Train, 1799 to 1849, barrack masters in England and Ireland, 1797 to 1852, and Royal Military Academy, 1839 to 1841.
	Appointment papers, etc, 1670 to 1855, consisting of original letters of application, testimonials, certificates of baptism, appointments, etc.
	List of barrack sergeants, 1771 to 1824.
rrangement	
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Inpublished finding iids	
Related material	
Separated material	
dmin History	Top of page [∧]
Administrative / biographical background	
ndex terms	Top of page [∧]
Corporate names	
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Places	
Subjects	T
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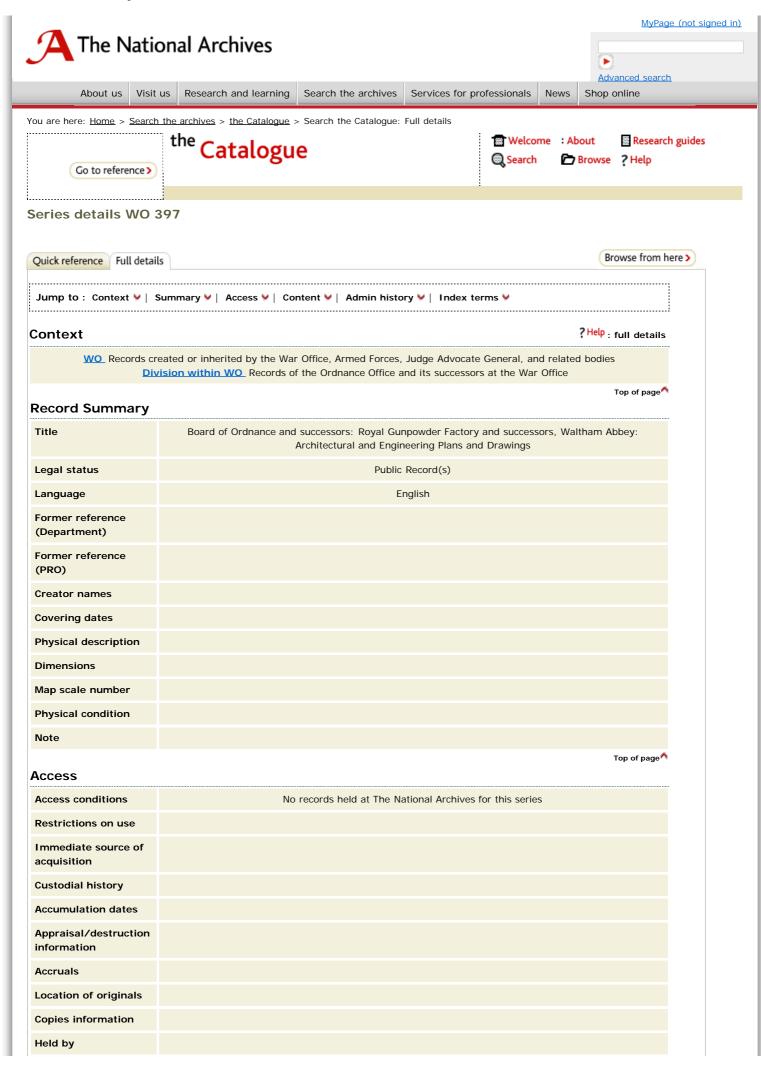
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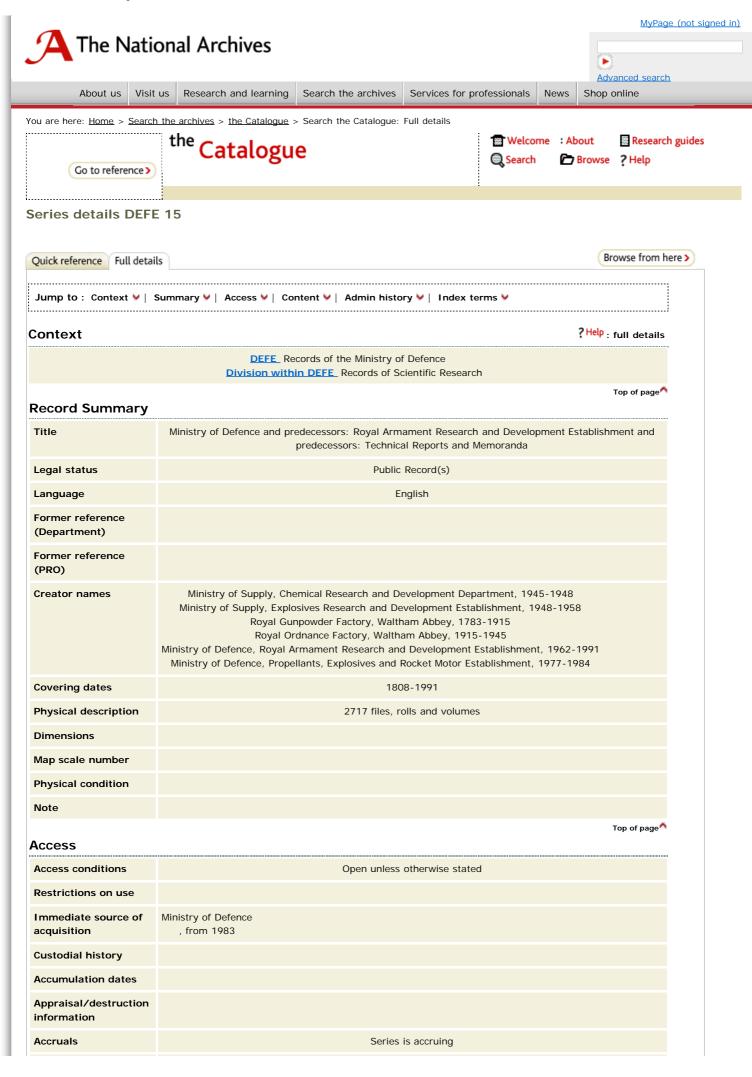
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Held by	The National Archives, Kew
	Top of page
Content	
Scope and content	This series consists of maps and plans of the site and buildings of the Royal Gunpowder Factory and successors, Waltham Abbey, relating to the manufacture of gunpowder. It also contains maps and plans, accumulated at Waltham Abbey, of other gunpowder factory sites and small arms factory sites.
Arrangement	
Publication note	
Unpublished finding aids	
Related material	See also DEFE 15
Separated material	Duplicates, unmarked plans and maps not selected for permanent preservation in the PRO have been offered to Epping Forest District Museum. For further records of the Chemical Research and Development Department see Ministry of Aviation Division within AVIA
Admin History	Top of page [∧]
Admin History Administrative / biographical background	The Royal Gunpowder Factory lies north west of Waltham Abbey on the River Lee. The first formal evidence exists for the presence of a gunpowder mill on the abbey site or nearby in the 1640s. In 1689 the mill's owner was awarded a contract to supply the Ordnance Office and in 1783 the government purchased the mill; it was to become one of what were later known as the Royal Ordnance Factories. From around 1862 the output of the factory began to diversify as more potent chemically based explosives such as cordite were produced. Gunpowder production ceased at the factory in 1941 following enemy bombing and production ceased altogether in 1943. The factory was formally closed as a Royal Ordnance Factory on 28 July 1945 and re-opened two days later as the Chemical Research and Development Department where research into explosives was carried out. In 1948, the department became the Explosives Research and Development Establishment and later became part of the Royal Armament Research and Development Establishment.
Administrative / biographical background	The Royal Gunpowder Factory lies north west of Waltham Abbey on the River Lee. The first formal evidence exists for the presence of a gunpowder mill on the abbey site or nearby in the 1640s. In 1689 the mill's owner was awarded a contract to supply the Ordnance Office and in 1783 the government purchased the mill; it was to become one of what were later known as the Royal Ordnance Factories. From around 1862 the output of the factory began to diversify as more potent chemically based explosives such as cordite were produced. Gunpowder production ceased at the factory in 1941 following enemy bombing and production ceased altogether in 1943. The factory was formally closed as a Royal Ordnance Factory on 28 July 1945 and re-opened two days later as the Chemical Research and Development Department where research into explosives was carried out. In 1948, the department became the Explosives Research and Development Establishment and later
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Administrative / biographical background Index terms Corporate names	The Royal Gunpowder Factory lies north west of Waltham Abbey on the River Lee. The first formal evidence exists for the presence of a gunpowder mill on the abbey site or nearby in the 1640s. In 1689 the mill's owner was awarded a contract to supply the Ordnance Office and in 1783 the government purchased the mill; it was to become one of what were later known as the Royal Ordnance Factories. From around 1862 the output of the factory began to diversify as more potent chemically based explosives such as cordite were produced. Gunpowder production ceased at the factory in 1941 following enemy bombing and production ceased altogether in 1943. The factory was formally closed as a Royal Ordnance Factory on 28 July 1945 and re-opened two days later as the Chemical Research and Development Department where research into explosives was carried out. In 1948, the department became the Explosives Research and Development Establishment and later became part of the Royal Armament Research and Development Establishment.
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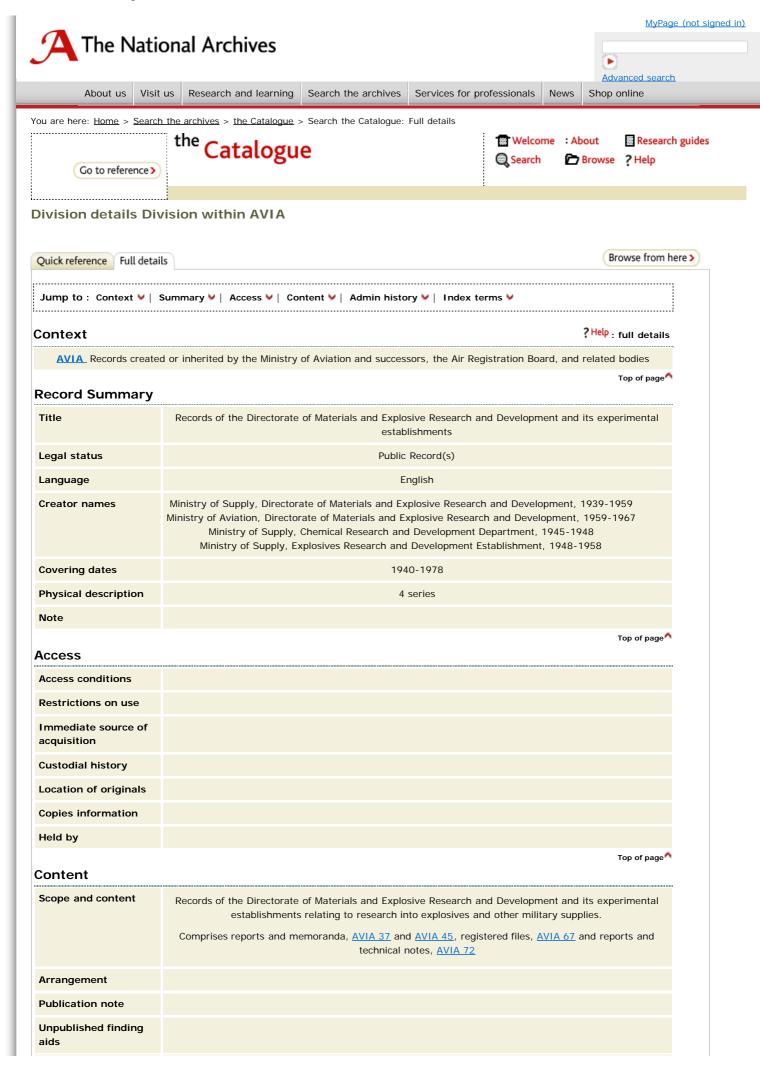
Content			Top of page [♠]
Scope and content			
Arrangement			
Publication note			
Unpublished finding aids			
Related material			
Separated material			
Admin History			Top of page [♠]
Administrative / biographical background			
ndex terms			Top of page [♠]
Corporate names			
Personal names			
Places			
Subjects			
·~			Top of page ^
Go to Your Archives	1 to this Catalogue entry on Your	Archives or see what other users may ha	ve written
			Catalogue Read
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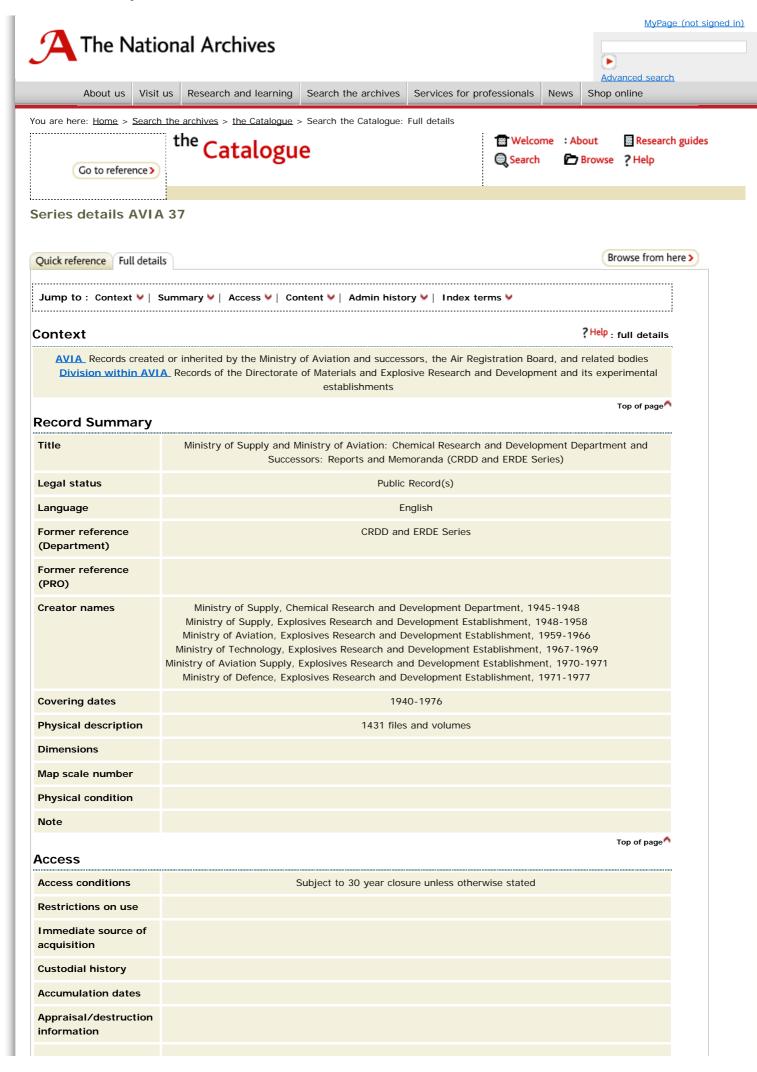
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Content			Top of page [▲]
Scope and content	Armament Research	eports and memoranda and some admi ch and Development Establishment and ces contain drawings, diagrams or phot	its predecessors.
0	ividity pre-	ces contain drawings, diagrams or prior	ographis.
Arrangement			
Publication note			п
Unpublished finding aids	Res	search establishments index with series	list
Related material	Further records relating to armament research and development are in: SUPP 28 WO 385 Further records relating to the Research Department, Woolwich are in SUPP 5 Military Vehicles and Engineering Establishment WO 194		
Separated material			Top of page
Admin History			Top of page
Administrative / biographical background	Department Woolwich, and its with the e	and Development Establishment (RARDE Design Department which was establish engineering design and development of epartment moved to Fort Halstead, Ken	need in 1922 and was concerned weapons.
	Department. They were design	nated the Armament Design Departmen vely. In 1948 the ARD's name was chan Establishment (ARE).	t and the Armament Research
	Establishment (ARDE), to integra	algamated in 1955 to form the Armame ate all stages of research, design and de iment Research and Development Estab	evelopment. On 8 February 1962
	Development Establishments a design and development of conve	y) to become part of the new MOD/CER and Research) in 1971, its primary concertional armaments for the Royal Navy, me Office on the hazards of explosives, forensic aspects of explosives.	ern continuing in the research, Army and Royal Air Force, whilst
	During the 1980s RARDE amalgamated with the Military Vehicle Engineering Establishment (MVEE), whose main sites were located at Chertsey and Christchurch, and the Propellants, Explosives and Rocket Motor Establishment which was based at Waltham Abbey and Westcott.		
		esearch Agency (DRA) was set up incorp , The Admiralty Research Establishment and Radar Establishment.	
Index terms			Top of page [♠]
Corporate names			
Personal names			
Places			
Subjects			
	tion to this Catalogue entry on Your	Archives or see what other users may	Top of page^ have written
			Cata
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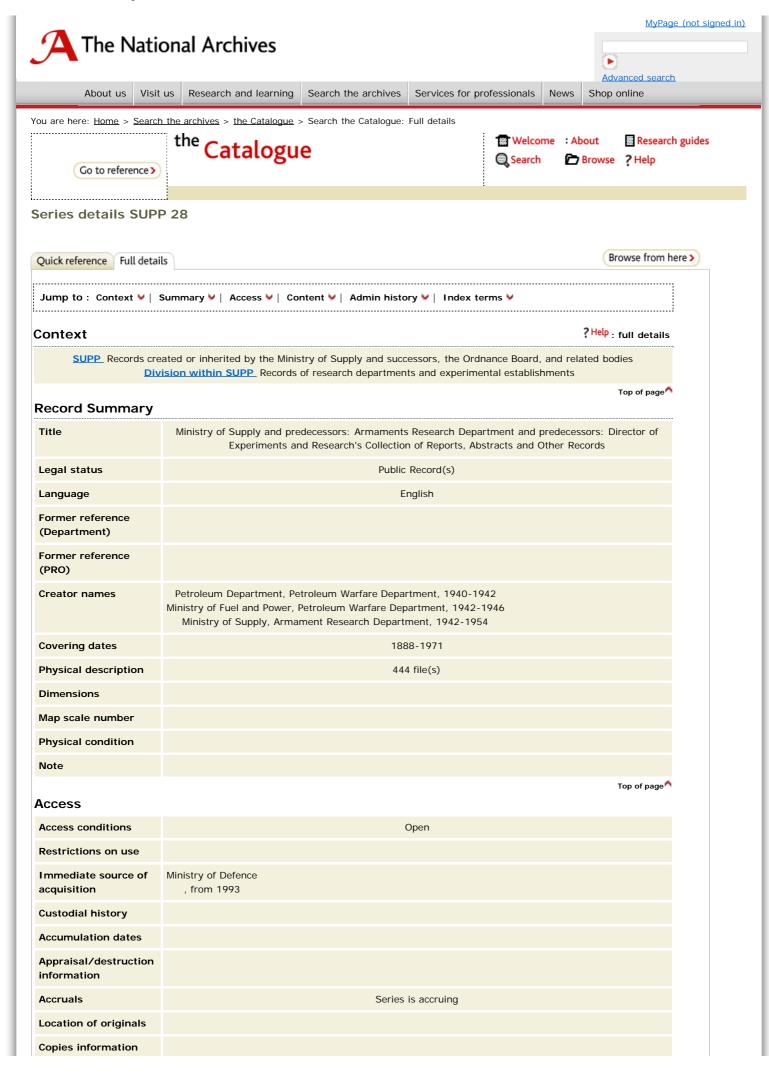
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Related material			
Separated material			
Ndmin Llistony			Top of page [♠]
Admin History			
Administrative / biographical background	Research and Development was t work at the Explosives Research	I later Ministry of Aviation's) Directorate of the headquarters directorate responsible for and Development Establishment, as well a ry at Waltham Abbey and the Tropical Test	or the funding and direction of as a Materials Advisory Service
	The Chemical Research and Development Department, was created in 1945 at the former Royal Gunpowder Factory, Waltham Abbey. In 1948 it became the Explosives Research and Development Establishment. It passed successively to the Ministry of Aviation in 1959 and the Ministry of Technology in 1967.		Research and Development
Index terms			Top of page [▲]
Corporate names			
Personal names			
Personal names Places			
	dangerous materials		
Places	dangerous materials		Top of page [▲]
Places	dangerous materials		· · · ·
Places	dangerous materials Site help	About us	, , <u>, , , , , , , , , , , , , , , , , </u>
Places Subjects		About us Jobs and careers	Catalogu
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Places Subjects Getting in touch Contact us	Site help Help index	Jobs and careers	Catalogu



Location of originals Copies information Held by			
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	The National Archives, Kew		
			Top of page [♠]
Content			
Scope and content		ne technical properties of explosives, prop- formerly the Chemical Research and Devel	
Arrangement			
Publication note			
Unpublished finding aids			
Related material	See also the re	ecords of the Director of Experiments and SUPP 28	Research in
Separated material			
Nation			Top of page [♠]
Admin History			
Administrative / biographical background			
-			Top of page
ndex terms			
Corporate names			
Personal names			
Places			
Subjects			
			Top of page [♠]
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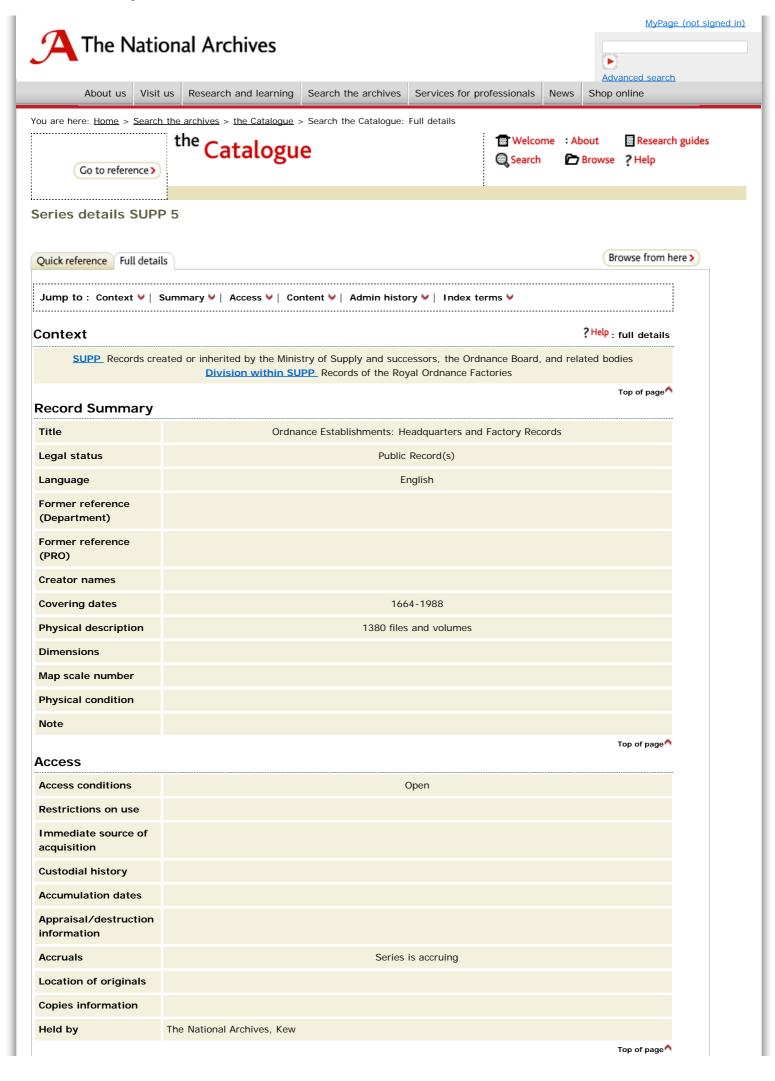
Content			
Scope and content	the Research Department (later	appear to have come from the Director Armament Research Department), Wool /orld War when the decision had been m research there.	wich and transferred to Waltham
	· ·	nensive set of reference abstract cards a vell as some miscellaneous research repo	
	or technological headings. The r by name of country. There is	100,000 Reference Cards. The bulk of the mainder, relating mainly to foreign mass also a sub-section under the generic tits (eg files) which are not part of this coll available in other PRO series.	tters, are filed under 'Foreign' or tle 'Reports'. Some reference
	ranging from letters and loose n	or the most part of source material repr ninutes, many giving scientific and techn including reports on experimental work	ical information of substance, to
	and related material. Included an work; periodic progress report report indexes and papers relati (mainly accession lists). The rese	rence material in the series covers a selfer research reports; drawings of apparates; reports from the Chemical Research and to Combined/British Intelligence Objection material covers experimental resultes, investigation into accidents and research	us; papers relating to committee and Development Department; ectives Committees - CIOC/BIOC ts, tests methodology, calimetry,
Arrangement			
Publication note			
Unpublished finding aids			
Related material		Other related series are: AVIA 37 AVIA 40 AVIA 59 AVIA 67 AVIA 68 DEFE 15 WO 385	
Separated material			Top of page^
Admin History			
Administrative / biographical background			
			Top of page [▲]
ndex terms			
Corporate names			
Personal names			
Places			
Subjects	weapons military research		
Add further informa Go to Your Archives	tion to this Catalogue entry on You	r Archives or see what other users may	Top of page^
			Cata
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Press office F	A-Z index ►	Terms of use ▶	•

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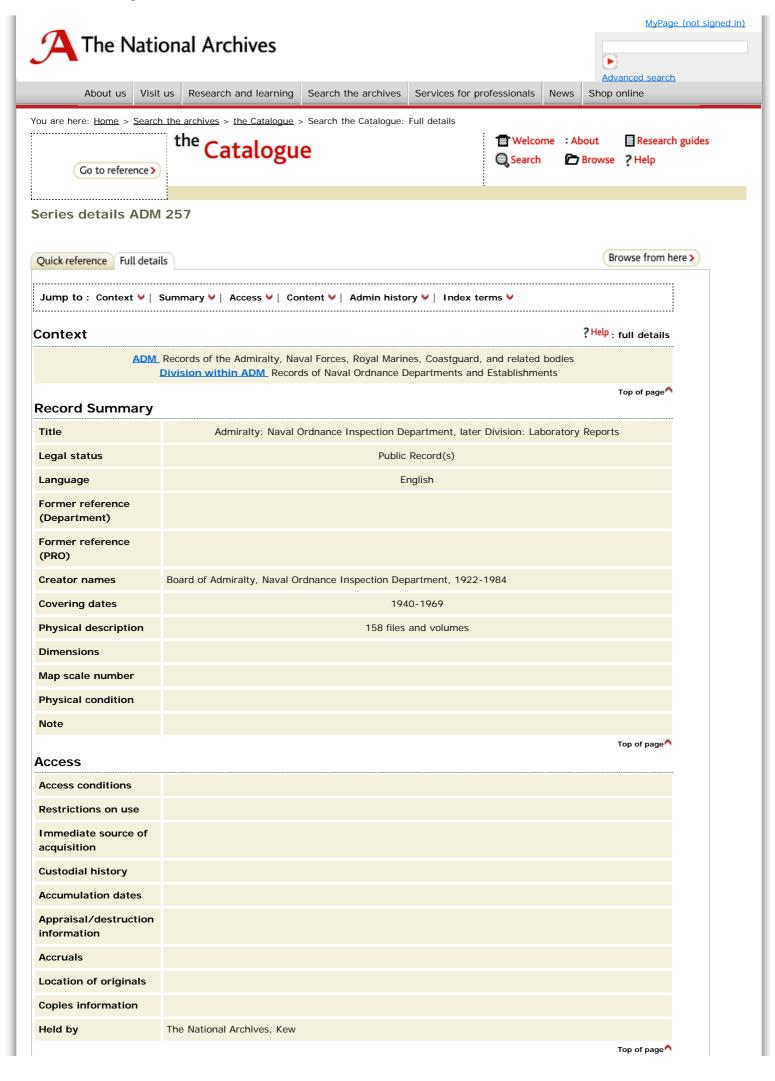
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Scope and content	and munitions factories, inclu	and miscellaneous records of Ordnance ording the Royal Ordnance Factories at Woo elsewhere.	lwich, Waltham Abbey and
	The series also includes an	nnual reports of the Master General (later (Controller) of Ordnance.
Arrangement			
Publication note			
Unpublished finding aids			
Related material	For further records of the	Naval Ordnance laboratory reports are in <u>A</u> e Research Department Woolwich and sucecords about cordite production are in <u>ADN</u>	cessors, see <u>DEFE 15</u>
Separated material			
Nalmain Lliataur			Top of page [♠]
Admin History			
Administrative / biographical			
background			
			Top of page [♠]
ndex terms			
Corporate names			
Personal names			
Places			
Subjects	ordnance		
	weapons		Ton of som
Ö			Top of page
Go to Your Archives	ation to this Catalogue entry on Your	Archives or see what other users may ha	ve written
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			Catalogue Re
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Contact us	Help index	Jobs and careers	Office of Public Sector Information
Press office	A-Z index	Terms of use	F
Press office			and the second s
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Content			
Scope and content	particular the Bragg Laboratory in Sheff metallurgical testing undertaken in con	•	ey relate to chemical and for the fleet. Some of the
Arrangement			
Publication note			
Unpublished finding aids			
Related material	Further	of the Royal Ordnance Factories see: SUPP 2 SUPP 5 reports of ACSIL are in ADM 213 e Select Committee, etc after 1855 are	in <u>SUPP 6</u>
Separated material			
A design I list a ma			Top of page [♠]
Admin History			
Administrative / biographical background	Ordnance (CINO) in 1922 to avoid to previously become evident after the base First World War. An area organisation empty and filled ammunition, to carry of service to the fleet based on gunwhate manufacture. In later years reorganisations caused in Quality (DWQ(N)), then, Directorate of Technical Service A laboratory for conducting metallurg Sheffield before World War Two, and we course of time it came to employ a with organisation and functions remained la separated to become part of the Director (Material)-MQAD], Army Department, and Naval Ordnance Inspection [later Service finally closed in 19). A subsidiary laboratory, dealing with Cae.	rfs and ammunition depots. This was later ture and ranging, and to mines. The mew names to be given to NOID; firstly, of Naval Ordnance Services (DN Ord S), vices (Warship Equipment) (DTS(WE)). The gical testing and instrumentation work for the was known as the Bragg Laboratory frow the derange of chemical and physical analyting unchanged until 1968. At that time or the order of Chemical Inspection [later Direct Woolwich. The laboratory continued, with the work being transferred to Woolwith propellants, existed at the Royal Naverwent, Chepstow, until 1971. The watory to man the tetryl laboratory which the service of the work of the control of the work	mmunition which had d, amongst others in the ufacture of weapons and id to provide a world-wide ter extended to torpedo Directorate of Weapons and later Directorate of or CINO was opened in m 1938 onwards. In the vical techniques, but the ie the chemical work was ctorate Quality Assurance with reduced work, as the ir NOSMU). The unit was vich. Ital Propellant Factory, Ith re-opened at the Royal Laboratory was formed at
			Top of page [♠]
Index terms			
Corporate names			
Personal names			
Places			
Subjects			
Add further informat	tion to this Catalogue entry on Your Archiv	ves or see what other users may have w	Top of page vritten Catalogue Reader v
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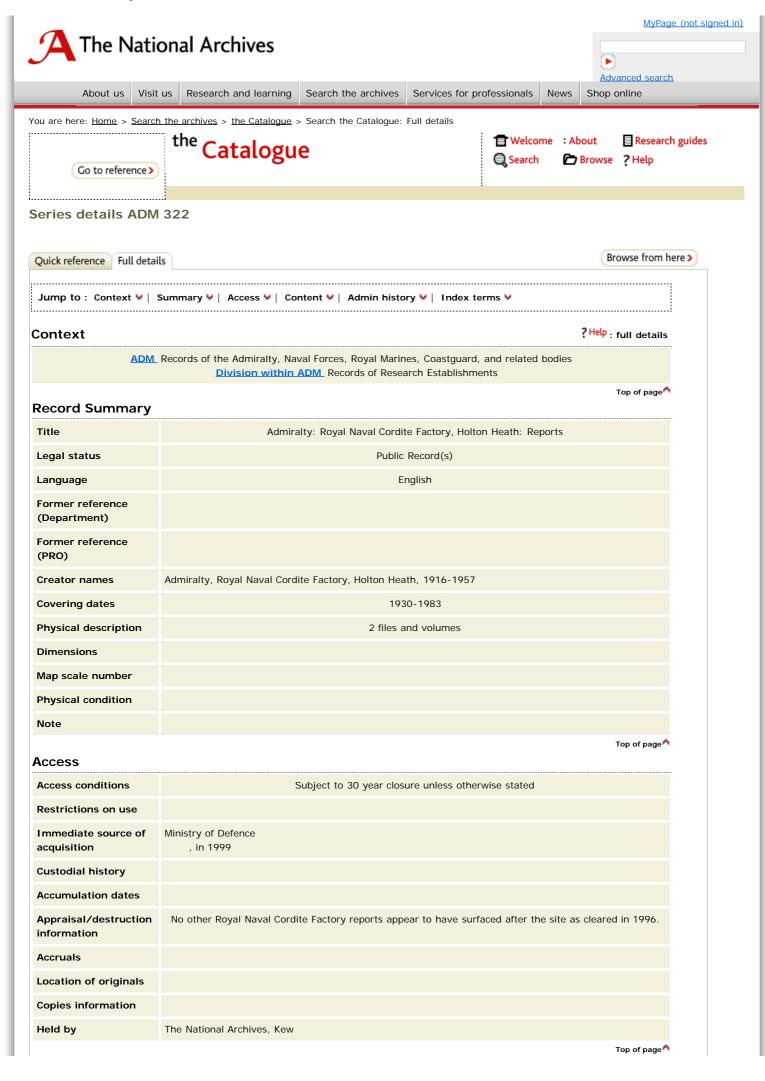
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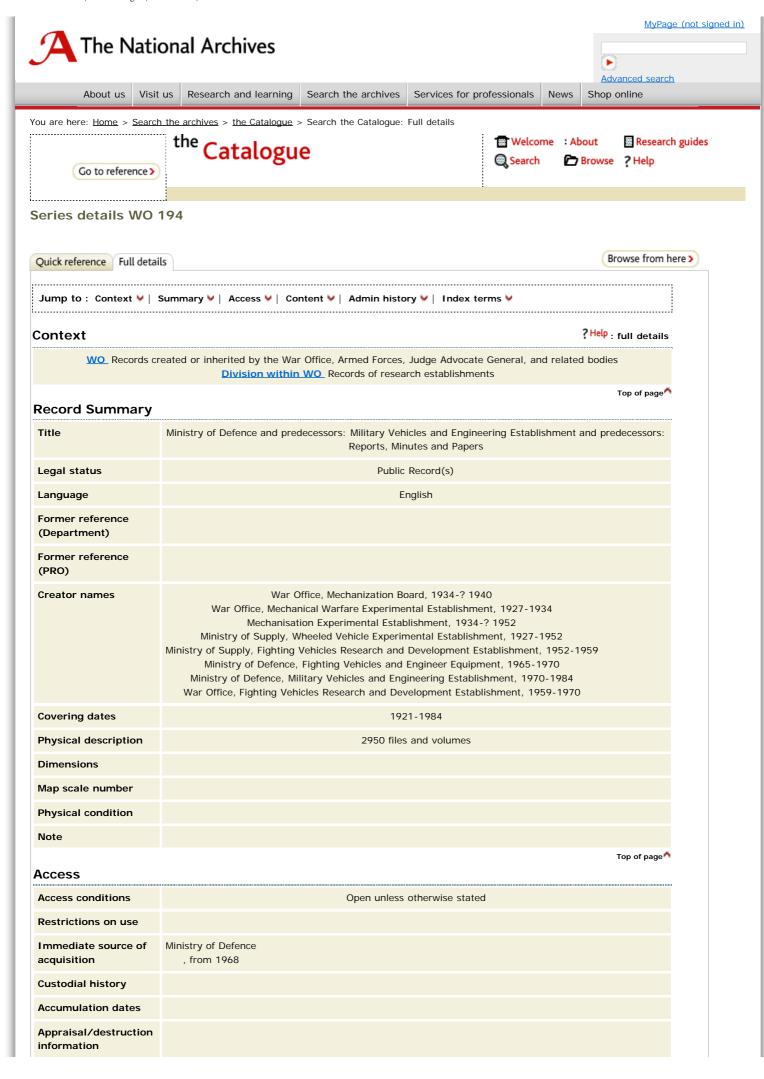
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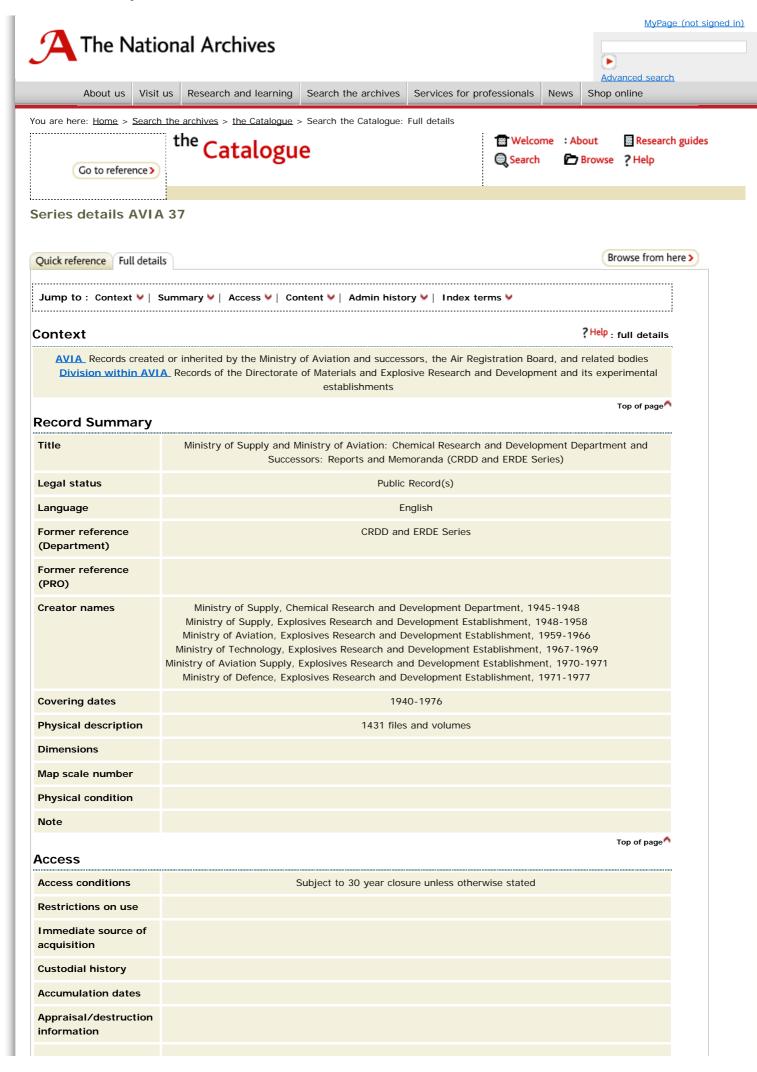


Scope and content	This series contains a published history of the Ada an example of one	miralty's Royal Naval Cordite let of its reports from 1930.	Factory, Holton Heath, and
Arrangement			
Publication note			
Unpublished finding aids			
Related material	Other records about cordite production	on including RNCF progress ca	an be found in
Separated material			
dmin History			Top of page [♠]
Administrative / biographical background	The Holton Heath Factory, near Poole in Dors production of high grade propellants for Naval sh but ceased production in 1957 with most of its Factory. However, the Admiralty Materials Labora t	ells. The factory was involved work having being taken over	in later rocket propellants by the Caerwent Cordite
ndex terms			Top of page [♠]
Corporate names			
Personal names			
Places			
Subjects	weapons		
		what other users may have y	Top of page [♠]
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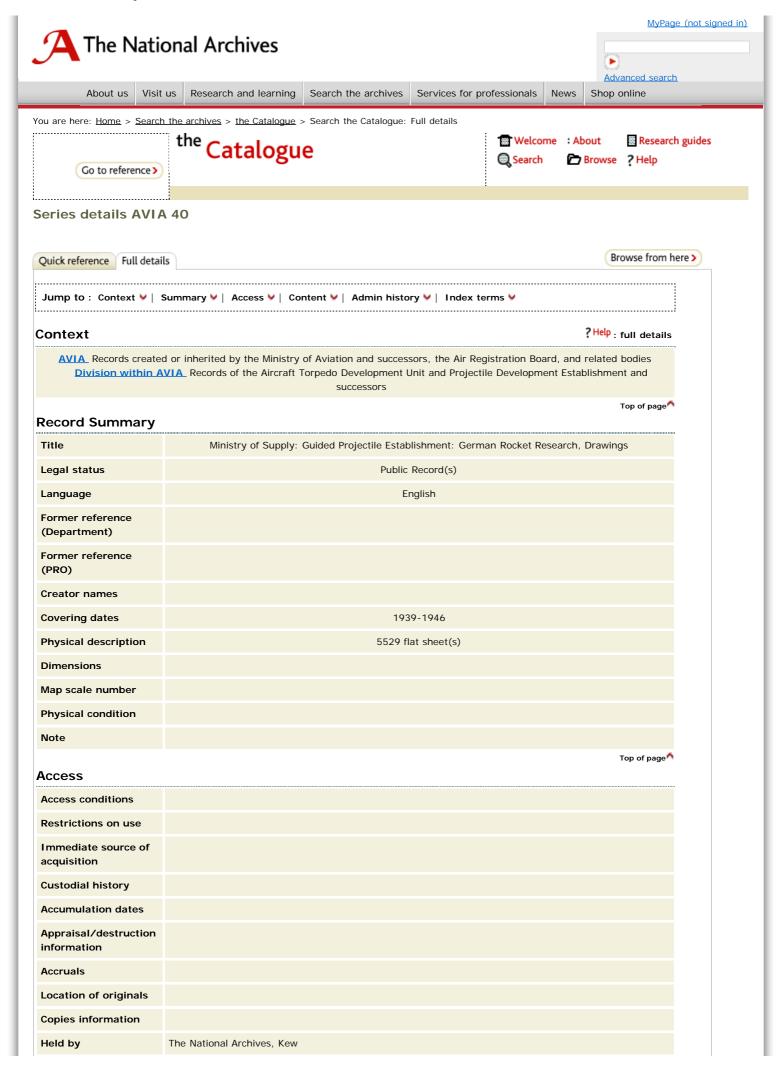


Accruals	Series is accruing
Location of originals	
Copies information	
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Content	Top of page
Scope and content	Technical reports of tests of fighting vehicles by the Military Vehicles and Engineering Establishment and its predecessors, minutes of meetings of sub-committees of the Mechanical Warfare Board and the Mechanization Board, data books and photographs and drawings of vehicles. Many pieces contain photographs, drawings and diagrams.
Arrangement	The records of tests carried out by the Fighting Vehicles Research and Development Establishment have been associated with the records of the vehicles concerned in the tests, and are filed in subject and numerical order.
Publication note	
Jnpublished finding	
Related material	For reports etc. compiled by the Military Engineering Experimental Establishment see SUPP 17 For reports from the Inspectorate of Fighting Vehicles and Mechanical Equipment see WO 362 For similar material, in the papers of the Royal Armoured Corps, see WO 341 For technical reports of the Headquarters British Army of the Rhine see WO 351
Separated material	Some of the earlier records of tests carried out by the Fighting Vehicles Research and Development Establishment are missing.
Admin History	Top of page
Administrative / biographical background	In 1917 the Mechanical Warfare Supply Department of the Ministry of Munitions added design responsibilities to those which it already possessed for tank supply. Its experimental grounds were at Dollis Hill in North London and Oldbury in Worcestershire. As part of the transfer of design and research functions back to the War Office after the end of the Grea War, the Tank Committee - which had been formed in the War Office in 1917 - was re-constituted in 1919. In January 1920 a Mechanical Transport Advisory Board was formed under the chairmanship of the Director of Supplies and Transport, in the Quarter-Master-General's (QMG) Department. The Tank Committee was re-named the Tank Technical Committee in 1922. In April 1919 responsibility for designs, patterns and specifications of arms and ammunition - and for the administration of research establishments - had been restored to the Director of Artillery within the Master-General of the Ordnance's (MGO) Department. In 1924 the Directorate of Artillery [D of A] had been split into two directorates, D of A (II) becoming responsible for administration of committees, research establishments, experiments and tanks and in 1927 D of A(II) was reconstituted as the Directorate of Mechanization, with responsibility for small arms tanks (later known as 'A' vehicles) and wheeled (later 'B') vehicles. In 1921 the experimental establishment set up at Dollis Hill was moved to Farnborough and renamed the War Office Tank Design and Experimental Branch (later Department). This had responsibility for the development of tanks. In 1923 it was reduced to a tank testing section and its design responsibilities were divided between the Research Department, Woolwich and industry. In 1926 design and testing functions were reunited in a Tank and Tracked Transport Experimental Establishment. This became the Mechanical Warfare Board. In 1934 they became respectively the Mechanisation Experimental Establishment and the Mechanisation Board. Under the Ministry of Supply the Wheeled Vehicle Expe
	the Military Venicles and Engineering Establishment
ndex terms	Top of page
ndex terms Corporate names	

Subjects	military vehicles		
_			Top of page [♠]
Go to Your Archives >		Archives or see what other users may ha	
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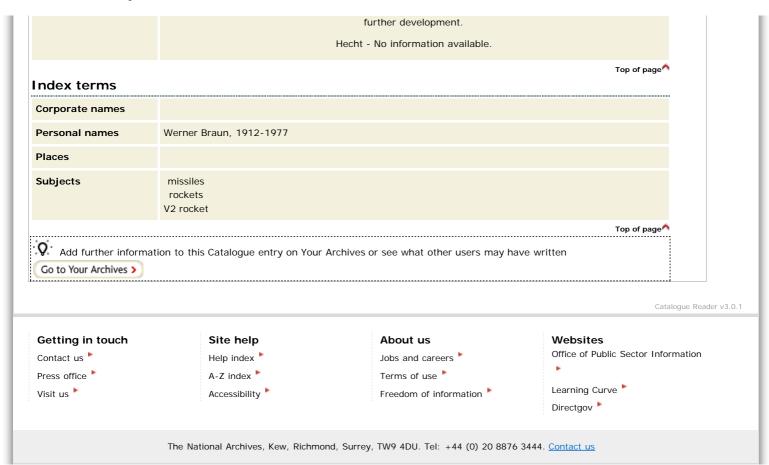


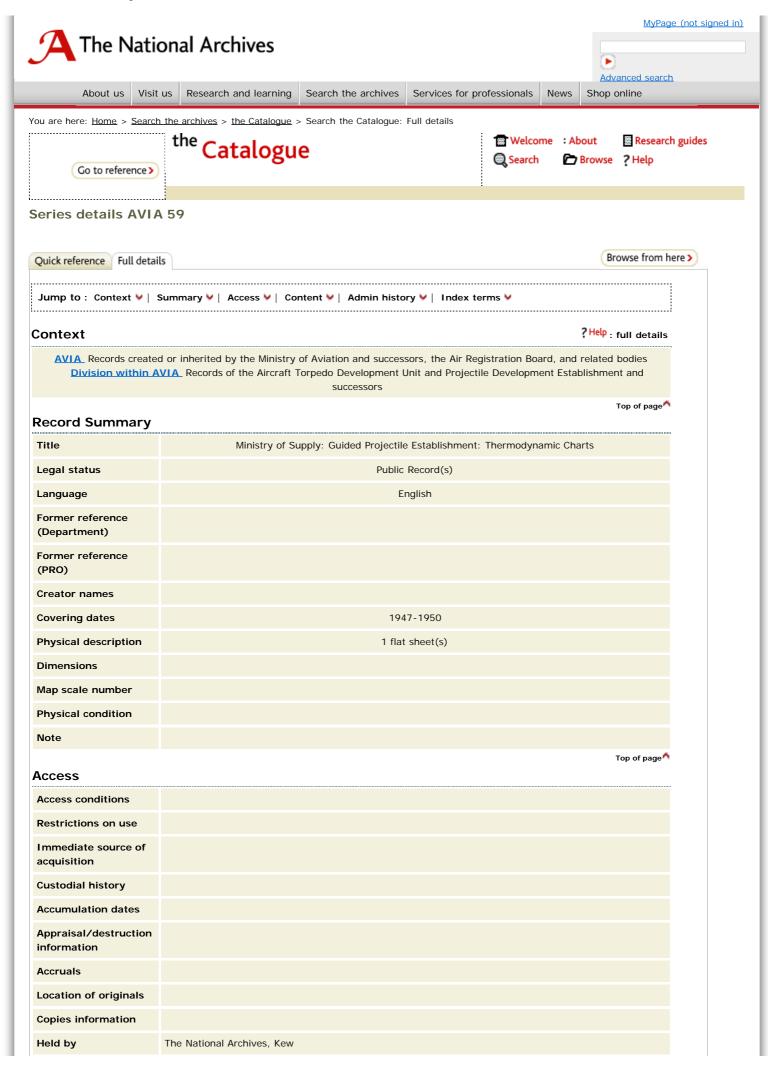
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Admin History			
			Top of page [♠]
Administrative /			
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Index terms			
Corporate names			
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Getting in touch	Site help	About us	Websites
Contact us	Help index	Jobs and careers	Office of Public Sector Infor
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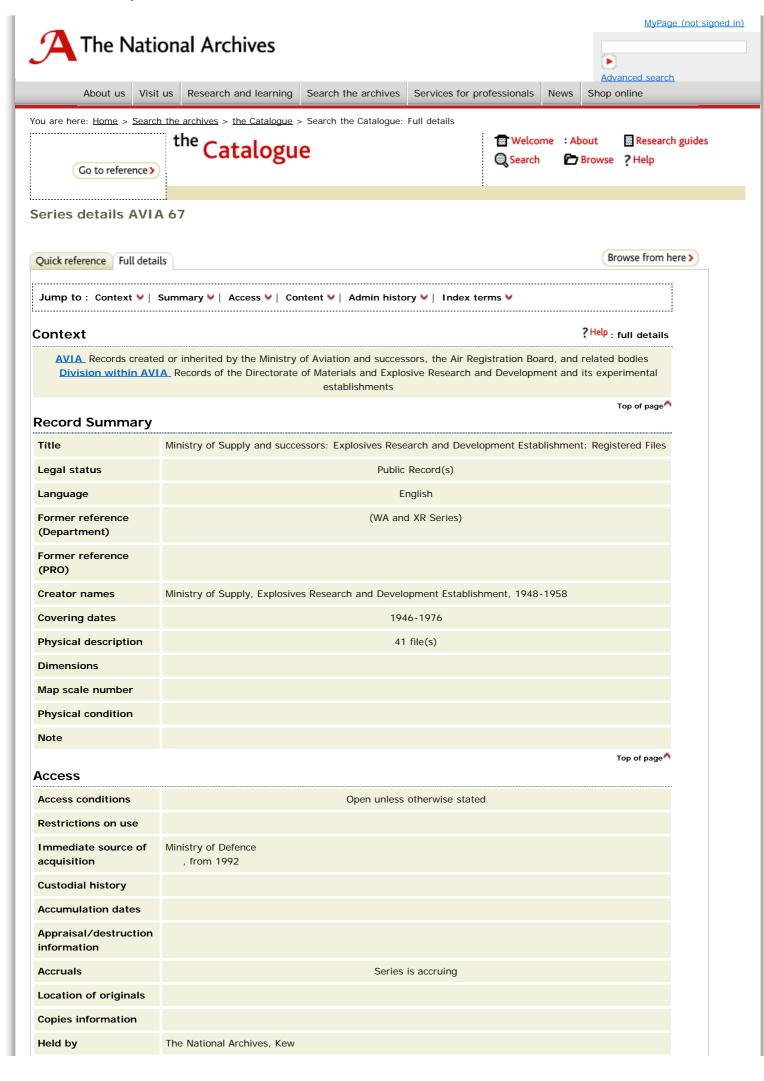
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Scope and content	These are mainly prints of original drawings taken into custody by the allied agencies engaged in collecting German documents at the end of the Second World War. They relate to various projects at German research establishments, including the A4 rocket, popularly known as the V2, but do not appear to constitute complete sets for each project.	
Arrangement	The German titles of the drawings have been used in <u>AVIA 40</u> . English translations of many of the terms used have been provided.	
Publication note		
Unpublished finding aids		
Related material	See also the records of the Director of Experiments and Research in SUPP 28	
Separated material		
Admin History	Top of page	
Administrative / biographical background	The first German Army experimental station established solely for the purpose of conducting rocket experiments was the Abteilung Versuch West at the Kunersdorf Artillery Range in 1930. This station tested the performance of propellants and was under the direction of Hauptmann Dornberger. A student group led by Werner von Braun, which had been using facilities at Reinickendorf was merged with the Dornberger group in 1933.	
	After six years of research and development the first successful firing tests took place at Peenemunde, but it was not until 1942 that a combustion chamber producing 25 tons thrust was developed. Work continued on improving the accuracy and performance of the rocket, and on the 8th September 1944 the first A-4 (V2) was launched against England.	
	During the war German research establishments were experimenting with several different types of rocket missiles. These, however, were of a defensive nature and did not receive the same priority as the V1 and V2 terror weapons. In the later stages of the war further development and production of such weapons was stopped completely.	
	GERMAN MISSILES - descriptive details	
	A4 - Popularly known as the V2 (Victory weapon). Surface to surface missile: A long-range fin-stabilised rocket, using a liquid oxygen and alcohol propellant, and carrying a one-ton explosive warhead, maximum range 225 miles. The launching site required only a hard surface, strong enough to support the missile and fuel-weight, and therefore with mobile firing equipment the site could be changed frequently. The weapon was essentially a large area random missile for use against cities.	
	It is estimated that about 3000 A-4's were used for testing and training purposes, with a 25% failure rate due to launching errors and structural defects.	
	HS 117 - Schmetterling. Surface to air missile: Designed for use against dircraft. Development of this weapon was curtailed in 1942, because of its defensive nature. When the tide of battle turned against Axis powers, work was recommenced but the missile never became operational.	
	Wasserfall. Surface to air missile: A radio-controlled super-sonic rocket, weighing less than 4 tons, with length of 25-ft, using a nitric acid and hydro-carbon propellant. It could be transported on a standard freight railway wagon and lifted into a vertical launching position without special equipment. Mechanical construction was simplified by the use of a compressed gas fuel feeding system and by replacing valves with diaphragms.	
	Work on the Wasserfall commenced during 1942 and by the end of 1944 some 25 missiles had been tested. Further development was stopped in the following year.	
	Enzian - Surface to air missile: A powerful ground-launched flak rocket intended to operate as a pilotless aircraft against heavy bomber formations. Experimental models were built from the end of 1943 until production ceased in March 1945.	
	Natter (Walter Power Unit) Surface to air missile: A small piloted, rocket propelled interceptor, intended to provide defence for vital targets. The missile was to be guided by an automatic pilot in the initial stages of flight, when closing in on a target the pilot would take over and fire a salvo of rockets from the nose of the craft. The pilot would then eject and descent by parachute; the propulsion would also break clear and descend by the same method for recovery and re-use.	
	Flight tests began in November 1944 and of the 30 units built, only one survived the tests. The drawing for this weapon relate only to the Walter Power Unit, which was the main constituent of this missile.	
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Rheintochter I Surface to air missile: A ground launched sub-sonic radio-controlled anti-aircraft rocket. Up to January 1945, 82 missiles had been test fired but development was stopped in February of that year. The weapon was not approved for mass production, but was used as an experimental model for



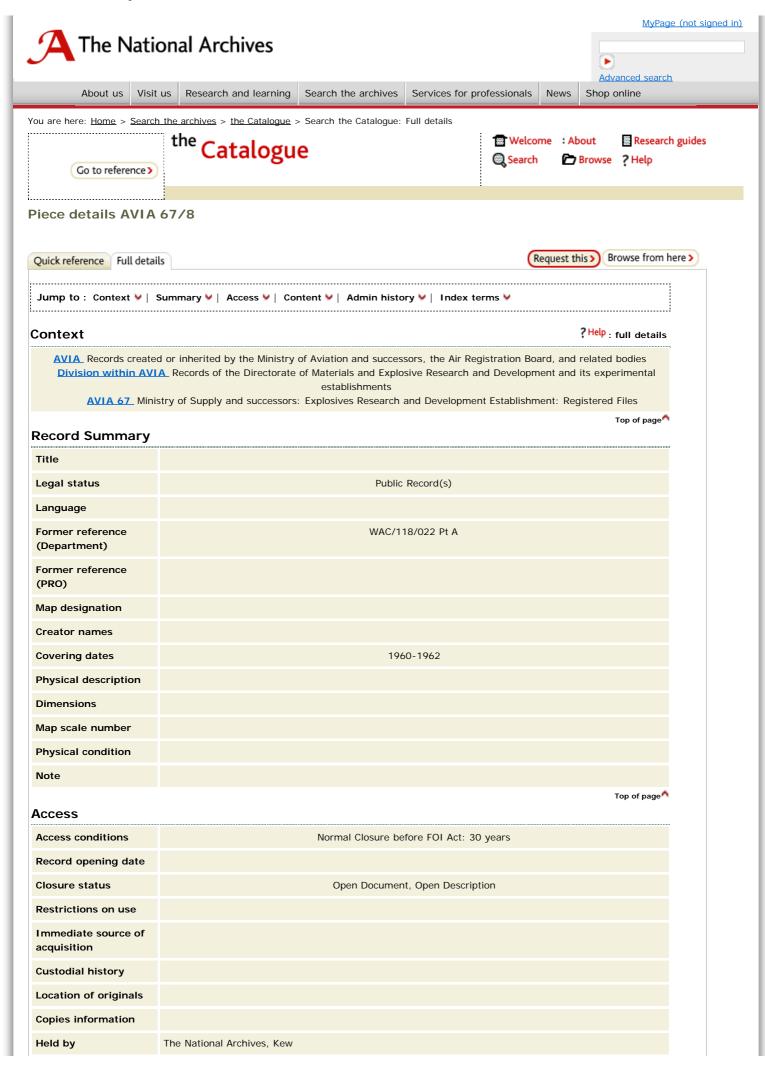


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cope and content		h were compiled by Dr. Hugo Karl Reiche stablishment during the period 1947-50.	ert of the Rocket Propulsion
Arrangement			
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Related material	See also the re	ecords of the Director of Experiments and SUPP 28	d Research in
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Admin History			Top of page [∧]
Administrative / biographical background	The charts show heat transfer of	rocket engines of the period and were w computer methods.	ridely used until superseded by
ndex terms			Top of page [♠]
Corporate names			
Personal names			
Places			
Subjects			
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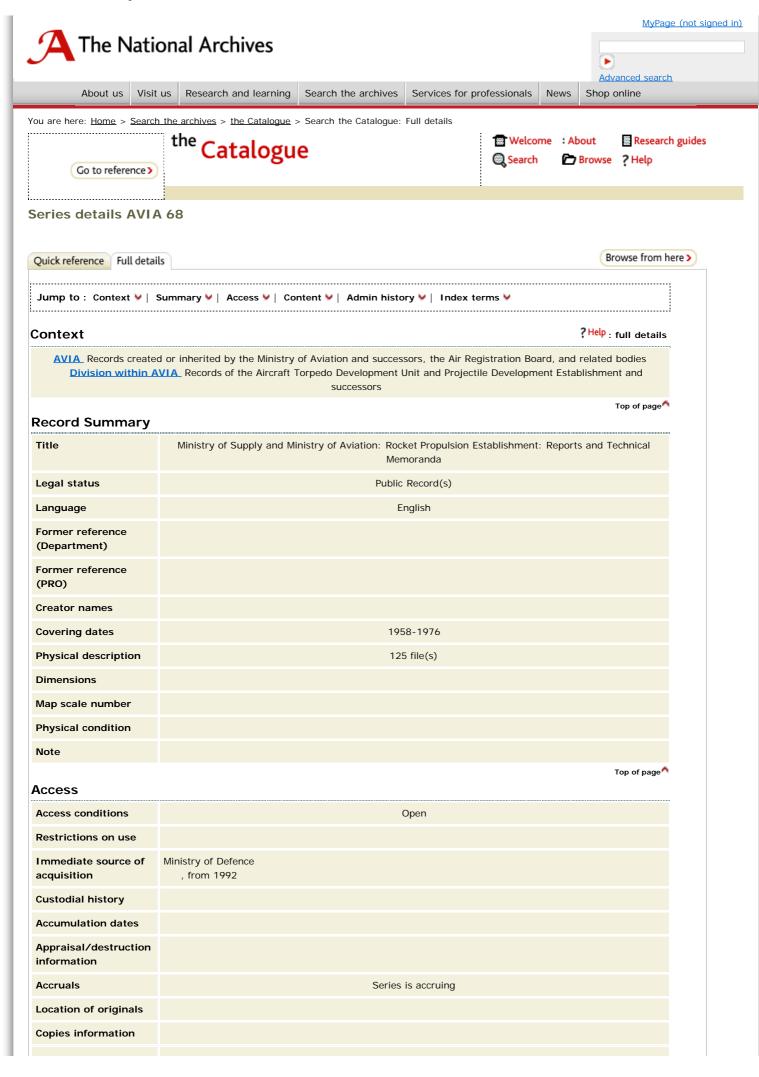


Scope and content	-	es Research and Development Establishmer ands as well as research into explosives, es missiles.	-		
	A technic	cal organisation chart (Sept 1962) is in AV	I <u>A 67/8</u>		
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Separated material					
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Administrative /	From the 16th century gunpo	wder was manufactured at mills on the Rive	er Lea near Waltham Abbey,		
biographical background	Essex, and th	ne industry passed into government owners	ship in 1787.		
3		e of more modern explosives was long esta	•		
		been centralised in the Royal Gunpowder Factory (RGPF). The factory was closed in 1945 but the site			
	· ·	remained in use firstly as an outstation of the Armament Research Department (ARD), then as the Chemical Research and Development Department (CRDD) of the Ministry of Supply (changed again for a			
	short period from a "Department" to an "Establishment", giving CRDE).				
	In 1948 the title was again changed to Explosives Research and Development Establishment (ERDE),				
	which accurately described the nature of its work. Most of the ERDE's work was concerned with				
	propellants, in later years mainly for guided weapons, though there were continuing programmes in other areas such as initiating compounds and research into non-metallic materials for defence use.				
	IN 1977 ERDE was amaigamate	ed with other organisations to become part and Rocket Motor Establishment.	or the Propellants, Explosives		
	ERDE was under the control, firs	itly, of the Ministry of Supply, and then of	the Ministry of Aviation (1959),		
	the Ministry of Technology (19	967), the Ministry of Aviation Supply (1970) and the Ministry of Defence		
		(1971).			
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Corporate names					
Personal names					
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Subjects					
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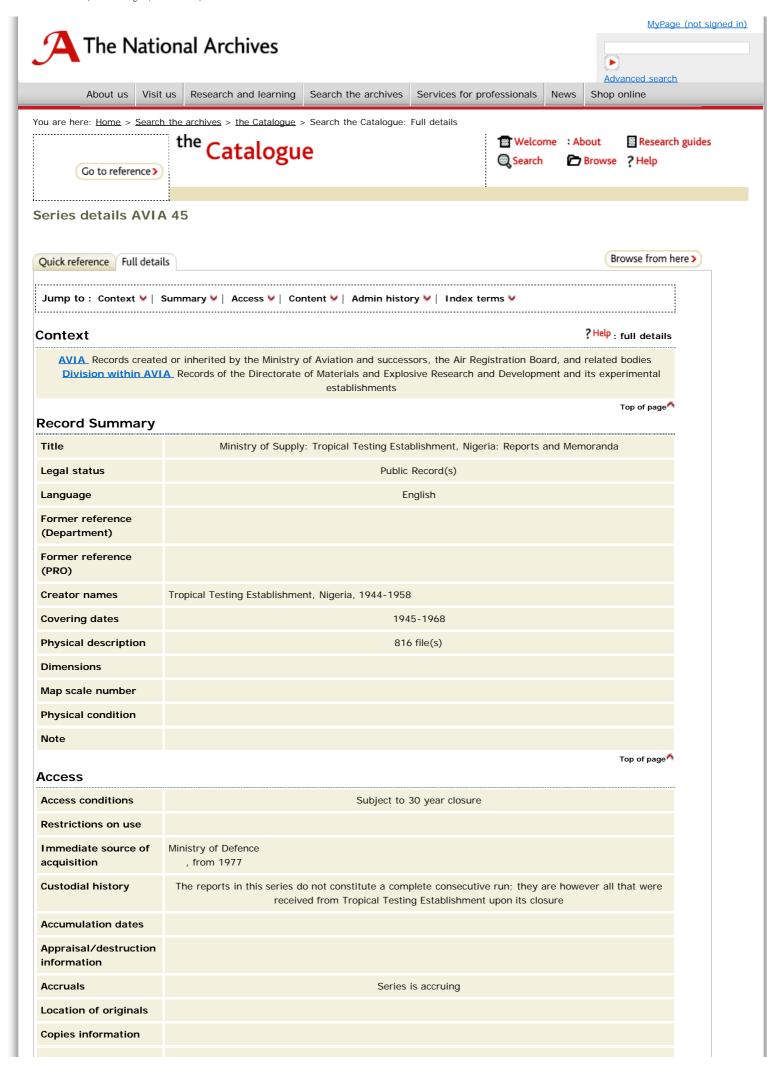
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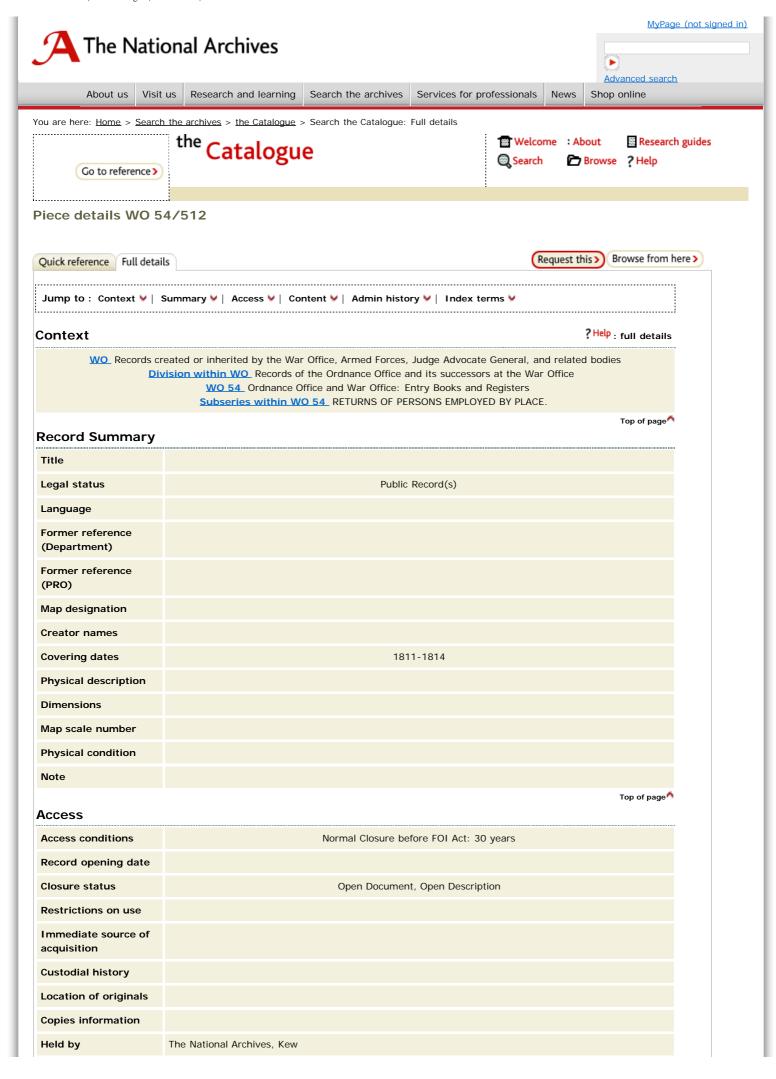
Content			Top of page [♠]	
Scope and content	ERDE progr	rammes of research and development 1	1960-1963	
Arrangement				
Publication note				
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Related material				
Separated material				
Admin History			Top of page [♠]	
Administrative / biographical background				
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Corporate names				
Personal names				
Places				
Subjects				
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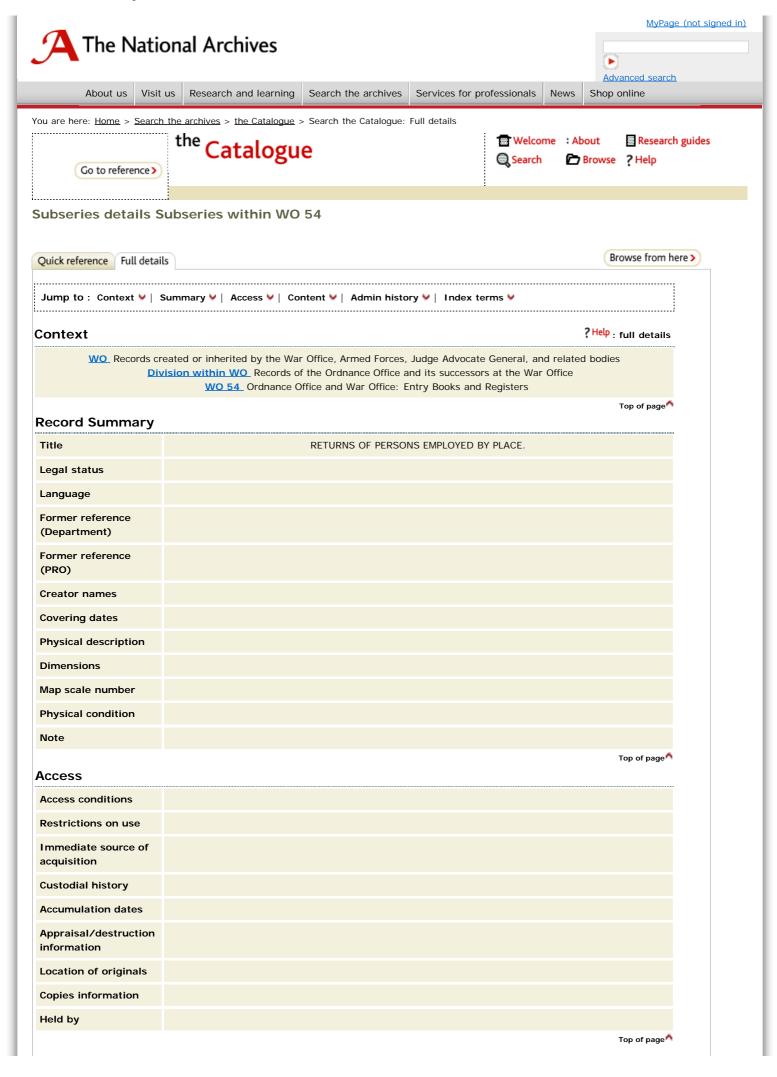
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Content				
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Arrangement				
Publication note				
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Admin History			Top of page [♠]	
Administrative / biographical background				
Index terms			Top of page 🧖	
Corporate names				
Personal names				
Places				
Subjects				
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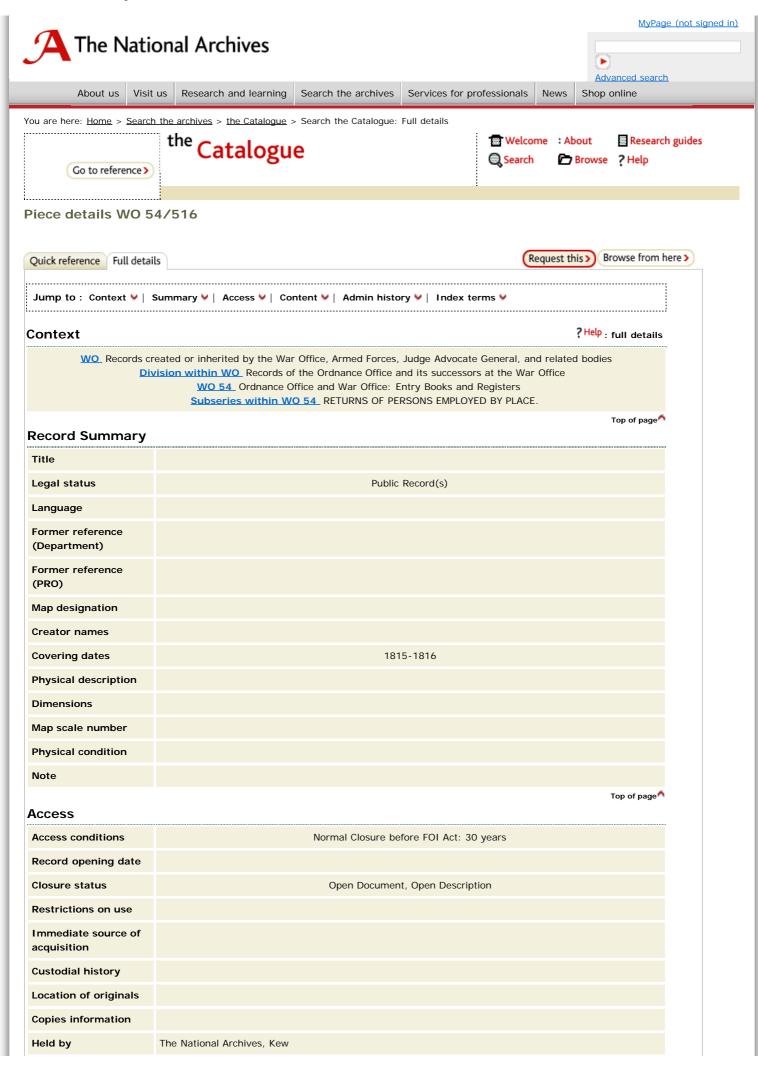
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Content			Top of page
Scope and content	Reports and memoranda on the susceptibility of equipment and materials to deterioration under tropical conditions, and quarterly reports on the work of the Tropical Testing Establishment from 1948 to 1958.		
Arrangement			
Publication note			
Unpublished finding aids			
Related material			
Separated material			
Admin History			Top of page [♠]
Administrative / biographical background	for storage and exposure tests of Tropical Testing Establishment and main testing area at Port Pequipment (S.R.T.T.E.) and adn and in April 1946 the two establishment, administered by the of testing a wide range of servi	Office/Ministry of Supply mission visited Von service equipment for use in the tropics. (W.A.T.T.E.) was established in Nigeria, will Harcourt. A similar unit, specialising in the ministered by the Ministry of Supply was all dishments were merged into a single organ the joint Ministry of Supply and Aircraft Profice equipment and packing until it closed in swere subsequently issued by the Ministry Aviation up until 1961.	As a result, the West African th its headquarters at Lagos testing of signals and radar ready in existence in Nigeria, nisation, the Tropical Testing eduction. It continued the work in September 1958. Residual
ndex terms			Top of page [♠]
Corporate names			
Personal names			
Places			
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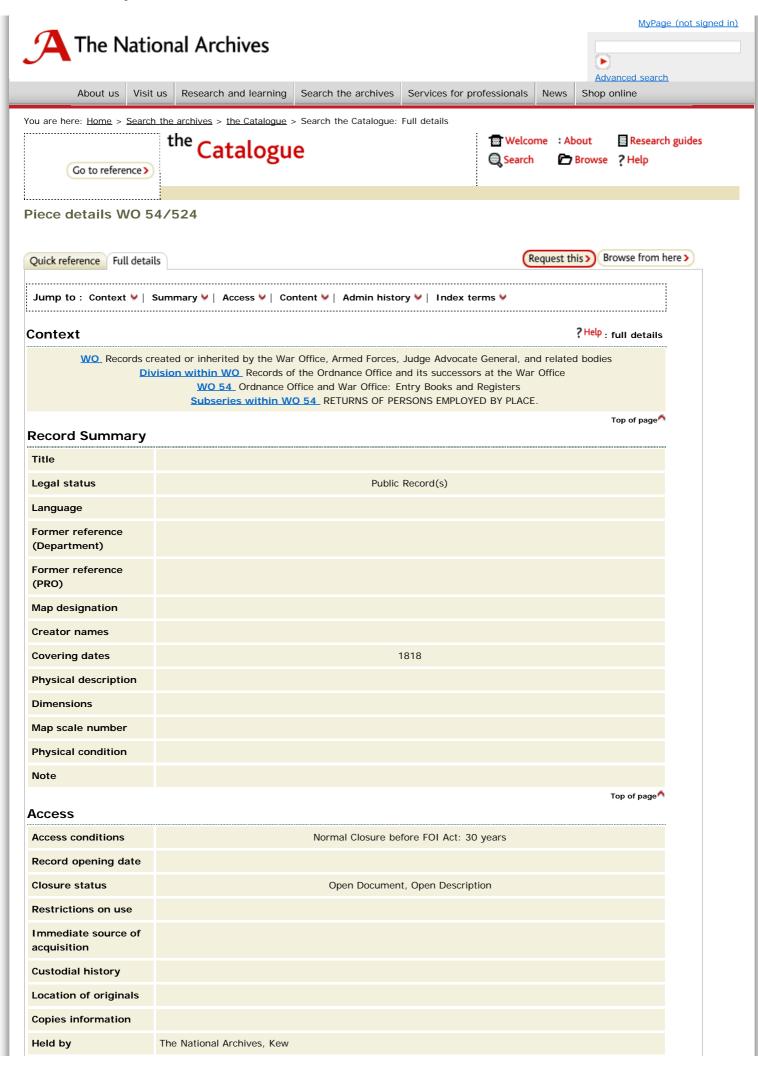
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Scope and content		Great Britain PZ.	
Arrangement			
Publication note			
Unpublished finding aids			
Related material			
Separated material			
Admin History			Top of page [♠]
Administrative / biographical background			
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Corporate names			
Personal names			
Places			
Subjects			
·~			Top of page [♠]
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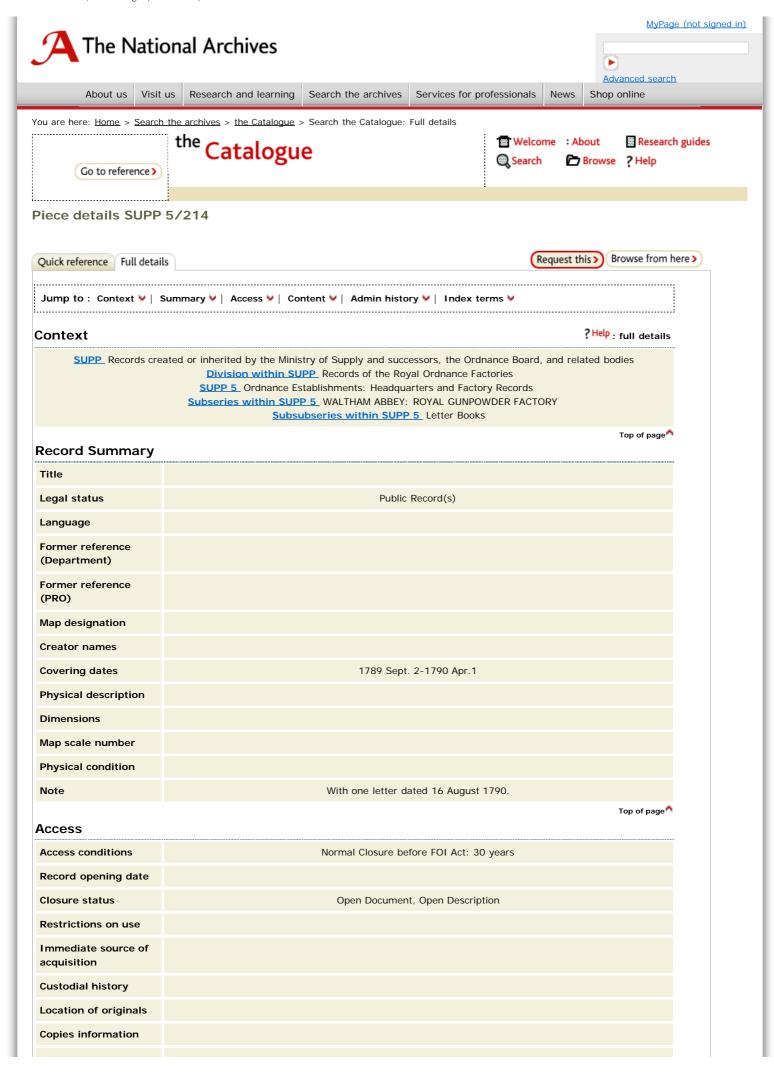
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Arrangement			
Publication note			
Unpublished finding aids			
Related material			
Separated material			
Admin History			Top of page [▲]
Administrative / biographical background			
Index terms			Top of page [♠]
Corporate names			
Personal names			
Places			
Subjects			Top of page [♠]
Subjects			
Subjects			Catalogue Rea
Subjects Getting in touch	Site help	About us	Catalogue Rea
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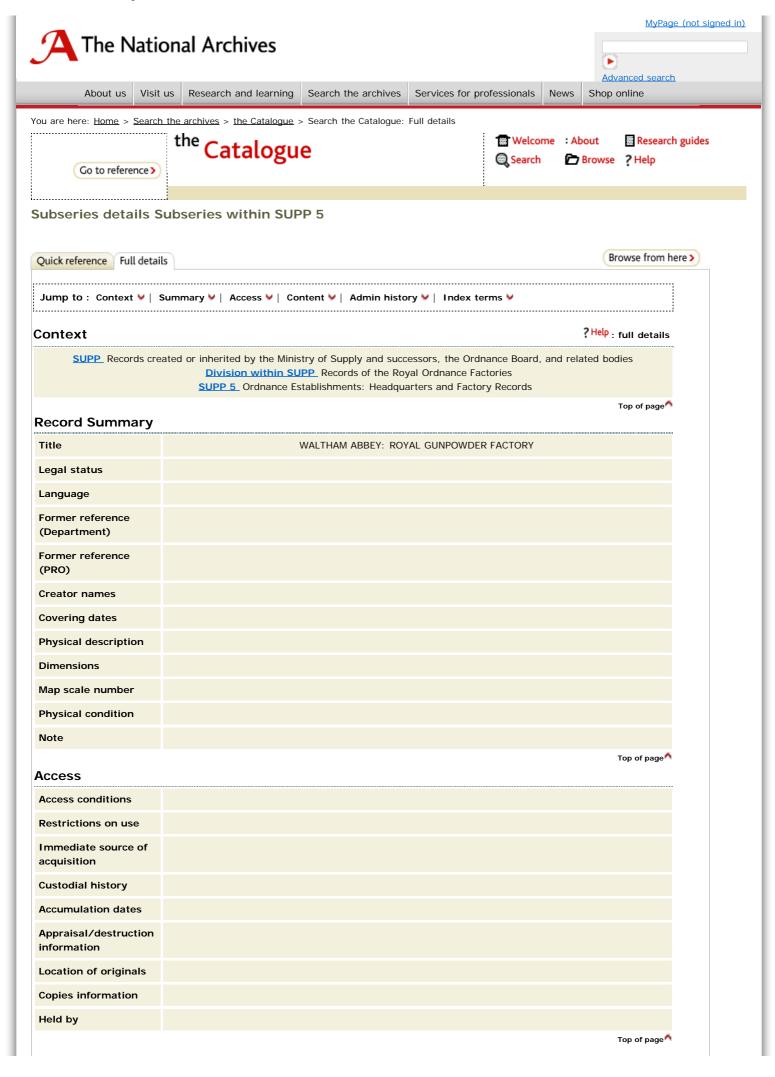
Content			Top of page [♠]	
Scope and content		Great Britain PZ.		
Arrangement				
Publication note				
Unpublished finding aids				
Related material				
Separated material				
Admin History			Top of page [♠]	
Administrative / biographical background				
ndex terms			Top of page [▲]	
Corporate names				
Personal names				
Places				
Subjects				
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Getting in touch Contact us Press office	Site help Help index A-Z index Accessibility	About us Jobs and careers Terms of use Freedom of information	Websites Office of Public Sector Information Learning Curve	1



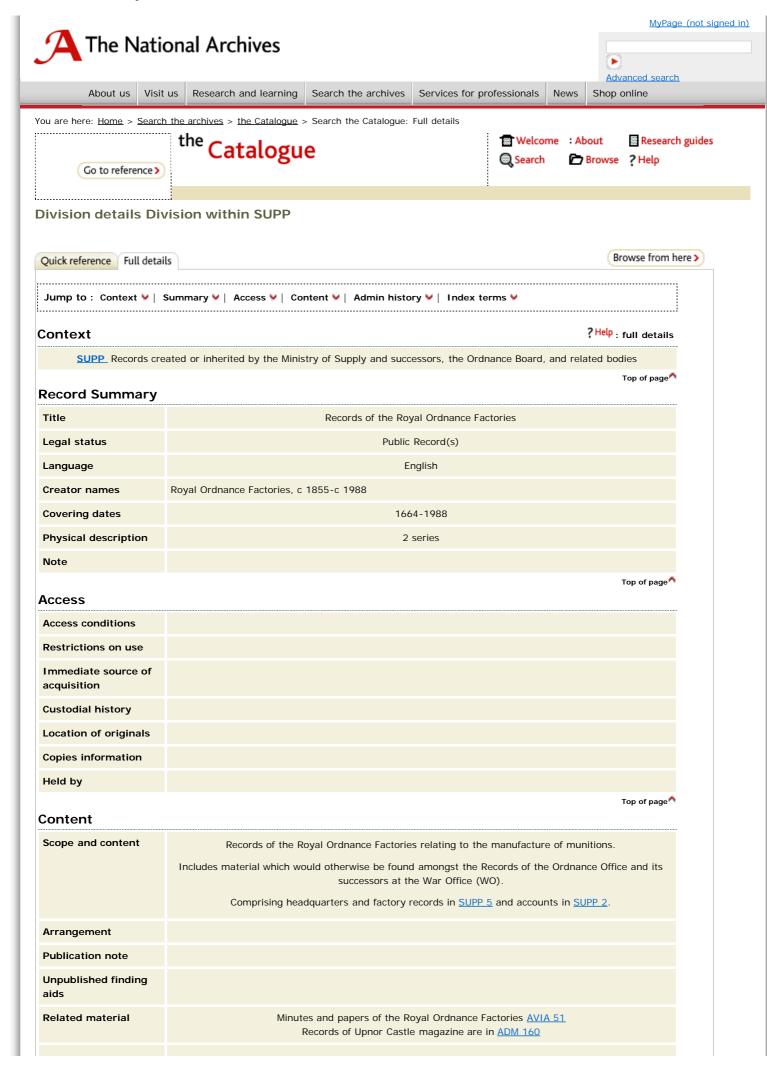
ontent			Top of page [▲]
Scope and content		Great Britain PZ.	
Arrangement			
Publication note			
Unpublished finding aids			
Related material			
Separated material			
Admin History			Top of page [♠]
Administrative / biographical background			
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Corporate names			
Personal names			
Places			
Subjects			
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Contact us	Help index	Jobs and careers	Office of Public Sector Information
Press office F	A-Z index ►	Terms of use	*
Visit us	Accessibility F	Freedom of information	Learning Curve



	The National Archives, Kew		Top of nous
content			Top of page [♠]
Scope and content		Entry Book of Out Letters. Vol. 4.	
Arrangement			
Publication note			
Unpublished finding aids			
Related material			
Separated material			
Admin History			Top of page [♠]
Administrative / biographical background			
Index terms			Top of page [♠]
Corporate names			
Personal names			
Places			
Subjects			
			Top of page [♠]
Add further informati	ion to this Catalogue entry on Your	Archives or see what other users may ha	ive written
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Contact us Press office	Help index A-Z index	Jobs and careers Terms of use	Office of Public Sector Information
Press office	A-Z index Accessibility	Freedom of information	Learning Curve

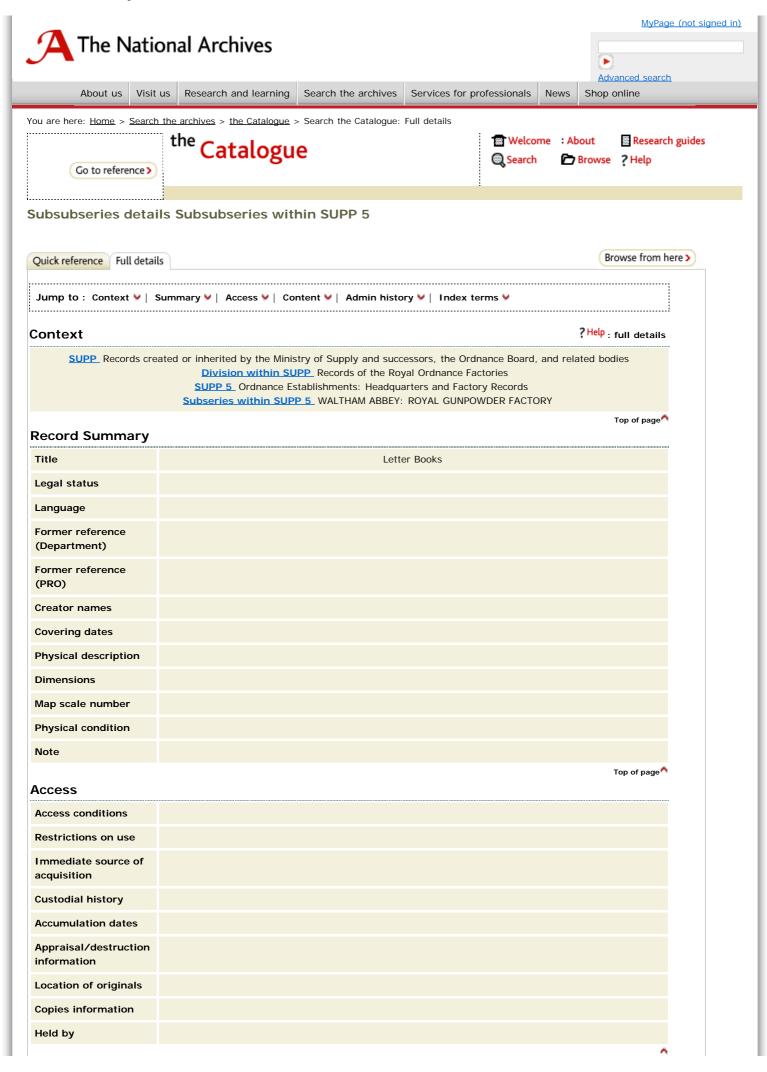


Scope and content			
Arrangement			
Publication note			
Unpublished finding aids			
Related material			
Separated material			
Admin History			Top of page [▲]
Administrative / biographical background			
Index terms			Top of page [▲]
Corporate names			
Personal names			
Places			
Subjects			
			Top of page [♠]
			Catalogue R
Getting in touch	Site help	About us	Websites
Contact us	Help index *	Jobs and careers	Office of Public Sector Informatio
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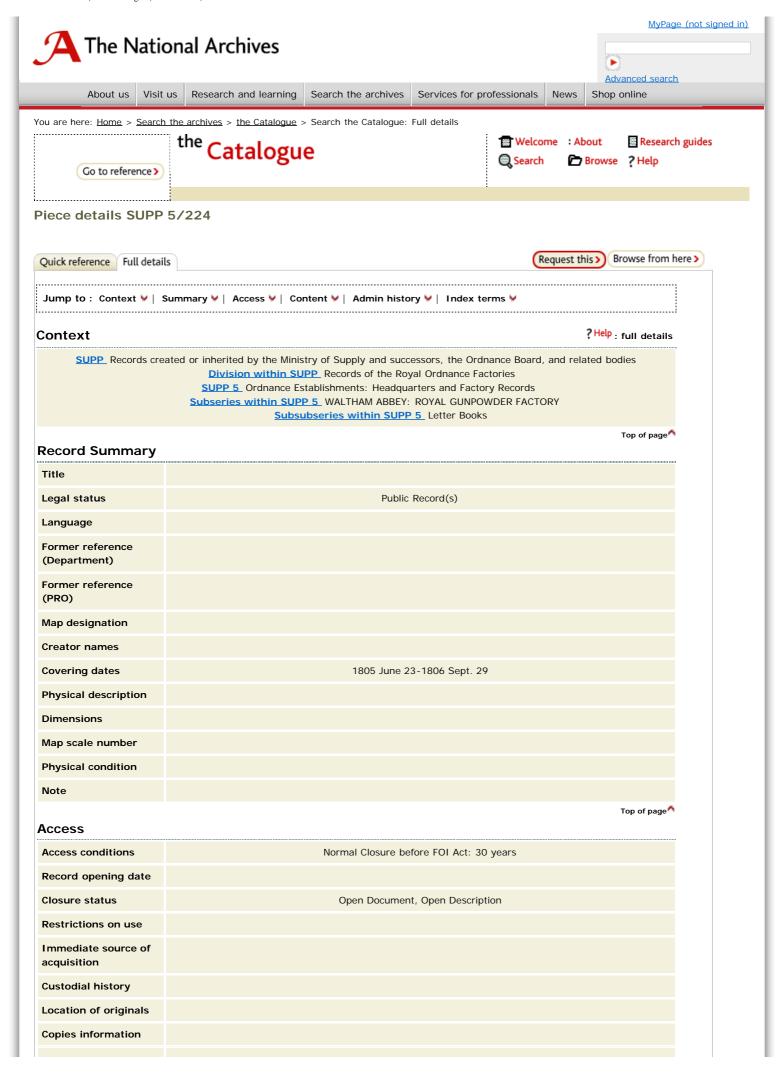


Separated material Balance sheets for 1921-1922 and 1936-1937 are missing Top of page **Admin History** Administrative / The Manufacturing Departments of the Ordnance Office were the predecessors of the modern Royal biographical Ordnance Factories. background The oldest was Woolwich Arsenal, renamed the Royal Arsenal in 1805. The Warren at Woolwich was first used for the proof of ordnance in 1651 and Tower Place was acquired for storage in 1670. Manufacture commenced when the Laboratory (later the Royal Laboratory) was established in 1696. Subsequently the Royal Brass Foundry for the manufacture of brass ordnance was founded in 1716 and the Royal Carriage Department was added in 1803. The manufacture of gunpowder commenced with the purchase of a privately-owned mill at Faversham in 1759 and the establishment there of the Royal Powder Mill. This was closed in 1825. Meanwhile another powdermill was purchased at Waltham Abbey in 1787 and named the Royal Gunpowder Factory. Powder was stored at Greenwich from an early date until 1763, when the magazine there was moved to Purfleet. It was also stored from at least as early as 1695 at Upnor Castle (later the Upnor Armaments Supply Depot). The manufacture of small arms commenced in 1804 at the Tower of London and moved in 1807 to the Royal Manufactory of Small Arms at Lewisham. The Royal Small Arms Factory site at Enfield was purchased in 1811 and operations commenced in 1816; the work of the Lewisham establishment was transferred there in 1818. When the Ordnance Office was dissolved in 1855, the manufacturing departments, namely the Royal Arsenal at Woolwich, the Royal Gunpowder Factory at Waltham Abbey and the Royal Small Arms Factory at Enfield, were transferred to the War Office. There they were the concern successively of the Artillery, Ordnance and Artillery and Stores Departments or Divisions. In 1887, when they were renamed the Royal Ordnance Factories, control passed to the financial secretary's Civil Department, from which in 1899 they returned to the Ordnance Department. Between 1915 and 1920 they were the concern of the Ministry of Munitions, but after the war they returned to the Department of the Master General of the Ordnance. In 1936 they were transferred to the Director General of Munitions Production. In August 1939 responsibility for the Ordnance Factories was transferred to the Ministry of Supply. There, at first, it was a directorate under the director-general of munitions production. Later it became itself a directorate general under the controller general of munitions production. In 1959 the Ordnance Factories returned to the control of the War Office. Top of page[♠] Index terms Corporate names Personal names Places Subjects weapons ordnance Top of page Catalogue Reader v3.0.1 Getting in touch About us Site help Websites Office of Public Sector Information Contact us Help index * Jobs and careers Press office * A-Z index * Terms of use ▶ Learning Curve Visit us Freedom of information * Accessibility 1 Directgoy 1

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Content			Top of page
Scope and content			
Arrangement			
Publication note			
Unpublished finding aids			
Related material			
Separated material			
Admin History			Top of page [♠]
Administrative / biographical background			
Index terms			Top of page [▲]
Corporate names			
Personal names			
Places			
Subjects			
			Top of page [♠]
			Catalogue Reader
Getting in touch	Site help	About us	Websites
Contact us	Help index ►	Jobs and careers	Office of Public Sector Information
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			Top of page [♠]
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Arrangement			
Publication note			
Unpublished finding aids			
Related material			
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Admin History			
Administrative / biographical background			
			Top of page [♠]
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Corporate names			
Personal names			
Places			
Subjects			
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Add further information	on to this Catalogue entry on Your	Archives or see what other users may ha	ave written
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