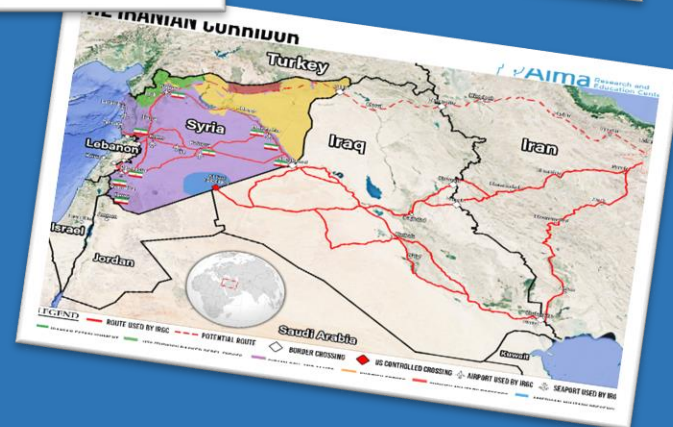
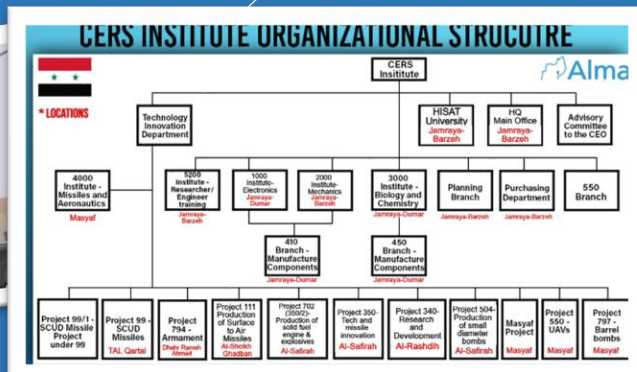


# The Weapons Development Industry in Syria (CERS)

## The Risk of Chemical or Advanced Weapons Ending up in the Hands of the Iranian Axis Proxies



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August 2023

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## **General - CERS Center and Its Importance**

**CERS center, established in Syria in 1971, is the Scientific Studies and Research Center (SSRC), or in its French name: the Centre D'Etudes et de Recherches Scientifiques (CERS). The center is a Syrian governmental organization whose declared goal is promoting, directing, and coordinating scientific activities in Syria.**

**The CERS Center employs around 20,000 people. The majority of the center's personnel are Syrian researchers, engineers, and military officers of various specialties. The facilities of the center are spread across Syria and comprise a variety of institutes, factories, industrial and storage sites.**

**The CERS Center serves as Syria's national military industry.** According to numerous studies and publications in the press, research institutes, and reports from intelligence agencies around the world over the years, the CERS Center is accountable for the research, development, and military production of advanced weapons such as surface-to-surface missiles (such as the M-600 / Fateh-110 missile, which is at the heart of the joint Iranian-Syrian and Hezbollah precision project), and it is even possible that the CERS Center is a partner in the "Labaik" project. In addition, the CERS Center is responsible for developing and manufacturing chemical, biological, and potentially nuclear weapons.

Furthermore, the CERS Center produces unique (but not necessarily advanced) weaponry such as barrel bombs and Al-Burkan rockets (barrel bombs mounted on a rocket). These weapons were deployed as conventional destructive weapons against resistance forces and civilian population centers in which they operated. Furthermore, the CERS Center produces basic and standard combat equipment such as helmets and combat vests.

The CERS Center is also defined as one that conducts economic, social, and industrial research and development. The center is in charge of computerization and technological equipment at Syrian universities and government departments, among other things.

**According to Iran's foresee, the CERS Center is envisioned as a "growth engine" for the development and production of modern conventional weapons based on Iranian technology on Syrian soil. Furthermore, the CERS Center operation shortens and saves the logistics of transferring weapons from Iran, which is more vulnerable to harm/disruption and obstruction.**

**Iran's major focus is to develop and manufacture precision missiles and rockets, cruise missiles, and unmanned aerial vehicles (UAVs) on Syrian soil, using the CERS Center's Institute 4000 infrastructure.**

The Syrian regime defines CERS as one of the most sensitive security bodies, if not the most sensitive. Since its foundation, the regime has maintained a high level of security monitoring over the CERS Center's operations and employees. Since the onset of the civil war and the turning of the CERS Center into a kind of joint Syrian-Iranian-Hezbollah platform, security monitoring has been intensified by the Quds Force and Hezbollah's security unit in Syria, Unit 9000. The Iranians' involvement grew and extended in all of the CERS Center's missions until it took control and monitored everything that transpired there. Certain initiatives, particularly those at Institute 4000 (Sector 4), are currently under direct Iranian supervision by senior IRGC Quds Force officers.

**The bottom line is that the CERS Center is an inseparable part of the infrastructure of the arms corridor to Syria and Lebanon, both in terms of the production of advanced weapons and their long-term storage for future use by the Shiite axis, as well as their storage in interim storage before transfer to Hezbollah in Lebanon. The CERS Center installations function as Hezbollah production plants, guided and supervised by Iranian expertise.**

**The CERS Center plays another critical function. The Center has vast experience and understanding of chemical weapon development and production. The Syrian leadership has fostered and developed extensive chemical capabilities to generate deterrence vis-à-vis Israel. The CERS Center was given responsibility for this in the 1980s.**

Institute 3000 of the CERS Center (later renamed Institute 5000 and Institute 6000) is responsible for developing chemical (and biological) weapons. Branch 450 of Institute 3000 is in charge, among other things, of storing, processing, and assembling chemical warheads in preparation for an assault. This capacity has never been deployed in an attack against Israel. However, it was used against the Syrian people multiple times during the civil war.

**Unlike the military nuclear project attempted by the Syrian regime with North Korean assistance, which was thwarted by Israel in 2007, the chemical program was never foiled, despite attempts to derail it. Although the Syrian regime claimed to have (supposedly) submitted all of its chemical weapons to the Organization for the Prohibition of Chemical Weapons (OPCW) as part of the 2013 chemical weapons disarmament procedure, chemical weapons were nonetheless used during the civil war.**

**We assess that the Syrian regime now possesses extensive chemical capabilities. The Syrian regime considers the stockpiles of chemical weapons in its possession and the threat they pose, as a guarantee of its survival. At will, this capability may benefit the radical Shiite axis led by Iran in general and Hezbollah in particular. Hezbollah's use of chemical weapons in the next confrontation with Israel cannot be ruled out.** It is conceivable that missiles/rockets armed with chemical weapons (such as Sarin nerve gas) are being stockpiled for use by Hezbollah in one of the CERS center's sites in the Masyaf area and will be transferred to Lebanon if so directed. We estimate with a high probability that in a situation of war, Israel will attack the chemical weapons stockpiles wherever they are, in Syria and/or Lebanon.

In any case, Hezbollah's tactical employment of any chemical weapons (available, simple, and rudimentary) in the next conflict with Israel cannot be ruled out. In our opinion, Hezbollah has mortar shells and missiles designed for this purpose, which can be armed and operationalized with the assistance of the CERS Center.

**CERS Center sites have been repeatedly targeted in recent years. This was in part to the notion that they were engaged in weapons development, manufacture, and storage under Iranian supervision as part of the corridor infrastructure, as well as in the chemical context. These assaults have not been acknowledged by Israel. According to Israeli media sources based on briefings from the Israeli Intelligence Directorate's Research Department, the attacks disrupted but did not entirely halt work at the CERS site. However, several projects were halted in the midst, and production ceased due to malfunctioning machines or injured personnel. Iranian motivation, on the other hand, has**

**not been weakened or hampered. The Iranians cling to their goals, even if it means cutting corners or sacrificing production quality.**

## **Appendix A - Background – Establishment, History and Administration:**

### **Establishment and history**

Syrian President Hafez al-Assad (father of current Syrian President Bashar al-Assad) established the CERS Center with Russian support in 1971. Dr. Abdullah Wathiq al-Shahid, a nuclear physicist who served as Syria's minister of higher education in 1967, was its inaugural director. Outwardly, it appeared to be a civilian organization. His covert purpose from the start, though, was weapons development. As a result, the organization was tasked with researching and enhancing weaponry systems for the Syrian army beginning in 1973.

The CERS site in Jamraya-Damascus was founded as a civilian organization to conduct research in fields such as solar energy, sewage refinement, and communications. The Civic Center attempted to acquire European technologies with the regime's backing. These technologies aided and reinforced Syria's chemical weapons development. The Syrian regime achieved its goal and financially assisted the center in obtaining UNESCO equipment and sending its engineers for training at the National (French) Center for Scientific Research. Until the early 1990s, the French government encouraged French technology businesses to collaborate with the Jamraya CERS site.

Schott Glaswerke, a West German manufacturer, supplied the Jamraya Center with high-resistance glassware in the mid-1980s. This was part of a glass project known as the "Borosilicate Glass Project" at the time. However, this was not a "glass project" but rather a Sarin gas-producing operation. Europe revealed the center's military operations in 1992, but the Assad regime already possessed an operational amount of Sarin and VX gas and the ability to create it independently.

The Supreme Institute for Applied Science and Technology - HIAST (ISSAT) was formed in 1983 under the auspices of the CERS Center. This was done so that it could instruct local Syrian engineers in the realm of this technology.

One of the CERS Center's key initiatives since its establishment has been the development and production of chemical weapons. According to several publications, the CERS Center has factories in Damascus, Hama, Homs, Aleppo, and Latakia engaged in the development and manufacturing of Sarin, VX, and mustard gas. Furthermore, the CERS Center is involved in the creation of biological weapons. All of the facilities are allegedly civilian. According to Western intelligence organizations, the CERS Center has received considerable knowledge to create and produce chemical weapons from Russian sources.

The US Department of Defense stated in the 1990s that the Assad regime began manufacturing gas-laden nerve paralyzing (VX) bombs in a subterranean site in Jamraya.

The CIA disclosed in 1996 that the Jamraya Center had obtained components for missile manufacture from the People's Republic of China.

The CERS Center was sanctioned in 2005 by then-US President George W. Bush, and three of its subsidiaries were sanctioned in 2007: HIAST, the Electronics Institute, and the National Laboratory for Standards and Calibration (NSCL).

In 2010, the then-head of Israel's counterterrorism agency, Nitzan Nuriel, stated that CERS had delivered weaponry to terrorist organizations such as Hamas and Hezbollah.

With the outbreak of the Syrian civil war in 2011, CERS enlisted to assist the Syrian regime in regaining power, including the production of chemical agents to gain control of opposition strongholds, and indeed, the regime used chemical weapons against its own citizens during the civil war.

On April 24, 2017, the US Treasury Department imposed sanctions against 271 CERS Center employees following the chemical attack in Khan Shaykhun (see details below). These employees were chemistry experts and worked for Assad's chemical weapons program from at least 2012 ([The list of "open sanctions" in the context of CERS can be seen at the following link](#)).

In a July 2015 interview, a former CERS Center employee who defected during the Syrian civil war disclosed private information regarding the CERS Center and clarified that the center concentrates on military operations. The major goal is to carry out activities against Israel (such as developing long-range missiles and producing chemical warfare chemicals). However, with the onset of the civil war, another objective was added: activity against opposition elements. In the Syrian civil war, strategic and chemical weapons intended for use against Israel were directed toward Syrian civilians (for more details from the interview, see the Iranian involvement in the CERS Center and backing for Hezbollah later in the report).



Above: Fatalities of the chemical attack in Ghouta a-Sharqiyah (August 2013)

### CONFIRMED CERS INSTITUTES, WEAPONS PRODUCTION AND STORAGE SITES ACROSS SYRIA



The CERS Center's director, Dr. Omar Mohammad Najib al-Armanazi, born in 1944, has led the CERS Center and its Board of Directors since 2007. Dr. Omar al-Armanazi is in his eighties and has a Ph.D. in electrical engineering from Columbia University in New York.



Above: CERS Center's director.  
Dr. Omar Mohammad Najib al-Armanazi

Salam Ta'ameh (originally from Tartus' Al-Matan district) is al-Armanazi's deputy, having previously served as head of Sector 4 (Institute 4000 in Masyaf) at the CERS Center. CERS's director and deputy report directly to Syrian President Bashar Assad. Simultaneously, Syrian army commanders supervise the center's work onsite. al-Armanazi has been in his current position since June 2022. It is unknown whether he is still serving as the CERS Center's director as of the publishing of this article.



## **Appendix B - CERS Center Activities During the Civil War in Syria:**

Beginning in 2011, with the outbreak of the Syrian civil war, the CERS Center pitched in to aid the Syrian administration in gaining control over the opposition. The Center advocated for two major issues: the development of chemical weapons and the development of unique weapons (barrel bombs and Al-Burkan rockets). The purpose was to create a deterrent and shock impact on the regime's rebel opposition elements.

### **Production of chemical warfare agents**

The first use of chemical weapons against Syrian opposition activists was reported in the Baba Omar district of Homs Province in December 2012. Following that, the Assad regime deployed chemical weapons at least four more times between March and May 2013. As a result, an estimated 100-150 people were killed. Some of these incidents were captured on video and shared on social media.

On March 19, 2013, an attack occurred in the northern city of Khan al-Asaf. According to reports, 31 individuals were killed in the strike, while 300 others experienced indications of a chemical attack. Six individuals were killed as well in a chemical shelling of al-Otaiba on the same day. On March 24, dozens of people were injured, and at least two people lost their lives in a Syrian government bombardment on Adra utilizing missile launchers armed with "chemical phosphorus bombs."

On April 13, 2013, another significant attack occurred in Sheikh Maqsoud, Aleppo. As a result, 31 people were killed. According to UN specialists in Geneva, there are "reasonable grounds to believe that limited amounts of toxic chemicals were used" in Aleppo, Damascus, and Idlib. Samples retrieved from victims of the April 29 shelling and helicopter attack in Saraqib found evidence of Sarin gas, overcoming any doubt that Syrian regime troops were responsible for the gas attacks, according to French Foreign Minister Laurent Fabius.

The first chemical strike on Ghouta al-Sharqiya was reported in the media in August 2013, killing dozens of civilians, including women, the elderly, and children.



Above: Bags of bodies (including children) slain in Ghouta al-Sharqiya as a result of the regime's chemical strike (August 2013).

According to August 2013 US intelligence reports, CERS manufactured chemical weapons for use against Syrian people during the civil war. Hundreds of Syrian people were killed or injured as a result of the chemical weapons. Following the chemical attacks, many difficult-to-view pictures and films were made public.

[In a particularly venomous video](#), a man clutches his two dead young children, yelling: "What did these children do to you, Bashar [Assad]?"

Israel and other Western countries were deeply concerned about the possibility of chemical weapons falling into the hands of Hezbollah (details below) or opposition parties, particularly global jihad groups such as the Al-Nusra Front and ISIS.

Branch 450 (details below) is the unit in charge of chemical manufacture at CERS, according to French intelligence. This unit is in charge of, among other things, loading chemical warheads and securing the places where these materials are housed.

An international investigating team discovered evidence of Sarin and VX nerve agents at one of the CERS Center facilities in 2015. This is despite the Syrian regime's announcement in 2013 that it had handed all of its chemical weapons to the Organization for the Prohibition of Chemical Weapons (OPCW) as part of the chemical weapons disarmament process.

Following the chemical attack in Khan Shaykhun on April 4, 2017, the US Treasury Department imposed sanctions on 271 employees of the Syrian Center for Scientific Research (on April 4, 2017, the Assad regime carried out a chemical attack on the town of Khan Shaykhun in Idlib Province, apparently using Sarin gas). Approximately 90 people perished, and hundreds were injured). These sanctions were imposed due to the fact that these individuals are chemists who worked for Assad's chemical weapons program since at least 2012.

France slapped sanctions on approximately 25 people and organizations in France, Lebanon, Dubai, and China in January 2018. France accused them of collaborating with the CERS Center in the manufacturing chemical weapons. France froze these people's and corporations' assets and accounts. They were part of two supply networks for the CERS Center in the context of chemical weapons development, according to French officials.

The European Union has also sanctioned over 270 people and organizations associated with the Centre and the creation of weapons of mass destruction.

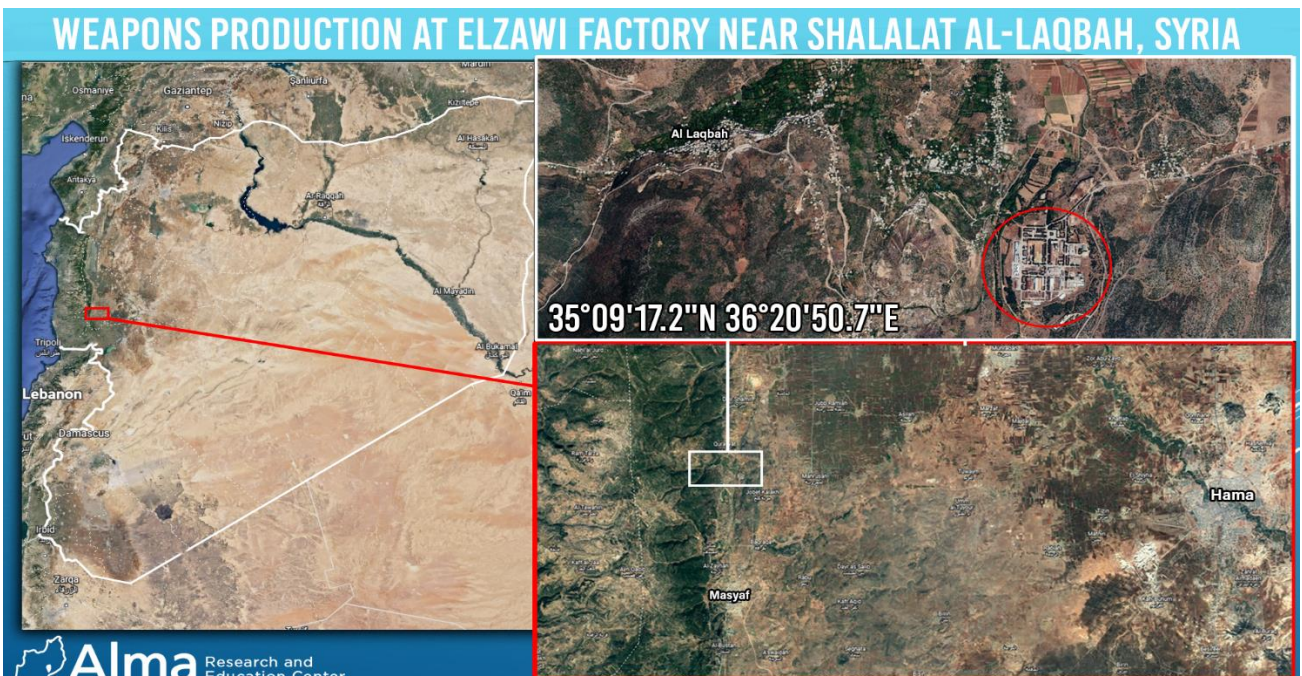
The Russian Foreign Ministry declared on January 31, 2023, that it was rejecting the findings of a global report that indicated the Syrian army was responsible for the fatal chemical attack in Douma on April 7, 2018, which killed over 40 people. The Russian Foreign Ministry characterized the report and its conclusions as Western manipulation. It should be noted that in the aftermath of the horrific chemical assault in Douma, the United States attacked the CERS Center in Barzeh, Damascus, on April 14, 2018.

The Syrian Archive organization published a special report in April 2018 detailing 212 chemical attacks carried out by the Syrian regime against opposition factions between 2012 and 2018. The chemicals in these attacks were manufactured in the CERS Center.



**Production of unique weapons**

In 2013, the CERS Center's 2000 Institute began developing barrel bombs. It also started converting naval mines and recycling outdated bombs and rockets that could deliver chemicals and barrel bombs. The manufacturing took place at the Al-Zawi facility at Shalalat al-Quba (شالات اللقبة، اللقبة)، west of Hama and north of Masyaf. Engineer Nasser Mohammad was in charge of the production.



As part of the warfare, the Syrian army dropped tens of thousands of barrel bombs on people from helicopters and planes. An explosive barrel can be one and a half to two meters long, half a meter in diameter, and weigh up to half a ton. The barrel bombs contained mixes of explosives or (exploding) fertilizers, flaming ingredients, and other chemicals. Metal and iron chunks were also used. The barrel bombs have an impact radius of hundreds of meters.

The warfare method was simple: Besieging the populated area where opposition elements were operating, massive shelling with barrel bombs (dropped from a height of about three kilometers) and other weapons on population centers where opposition activists were present until their surrender/death, regardless of the uninvolved civilian population.



Above: An unexploded barrel bomb

Many videos have been posted showing Syrian army helicopters and planes dropping barrel bombs on population centers, [such as these two videos, the first, from the Darya area west of Damascus in 2016.](#)

[And the second, from the Idlib region in 2020.](#)

[In this video, you can see a barrel bomb that did not explode.](#)

Institute 2000 also manufactured long- and short-range rocket and missile launchers, including the Al-Burkan rockets used in the August 21, 2013, Sarin chemical assault in Al-Ghouta al-Sharqiya. Al-Burkan rockets are short-range rockets with extremely massive warheads. Aside from providing a platform for chemical weapons, its primary use is with conventional explosives, and they may create widespread devastation within a considerable radius of their impact.

Al-Burkan rockets are basically barrel bombs that have evolved into rockets.

This type of rocket with conventional warheads is also possessed by Hezbollah in Lebanon and Hamas in Gaza. [The video shows](#) (and you can hear) Hezbollah operatives explaining the firing of Al-Burkan rockets in the Yabrud area of Syria in 2015 while viewing the area where the rocket landed.



Above: Al-Burkan rockets in Syria (notice the large warhead)

## **Appendix C–The Assassination of CERS Center Workers who opposed the Assad Regime:**

During Syria's civil war, there were defectors who deserted the CERS center for the resistance, as well as employees of the center who were executed on allegations of endangering the security of the Syrian state, all belonging to the Sunni community. For example, Branch 227 of Military Security arrested 13 CERS Center employees on charges of endangering state security due to their possible opposition support, including Dr. Yassin al-Masri from Daraa, doctoral student Feras Balhi from Daraa, engineer Fawaz Orfali from Damascus, engineer Rajab Shanak from Aleppo, Ahmad Hamda from Barzeh al-Balad, Jamal Akleh from Daraa, and Col. Engineer Ziad (note – "Military Security" is one of the four internal security branches of Syria along with "General Security," "Air Force Security" and "Political Security").

In November 2015, Syrian media stated that four top commanders of Assad's army had been executed on the orders of Iranian officials present at the Syrian presidential palace, after being accused of "refusing orders and attempting to carry out a military coup in Syria." Badia Ali Khadur (بدیع علی خضور), an officer in the Assad government with the rank of major general (Liwa), served as a scientist at the CERS Center and was an engineer and leader of an array at one of the CERS sites. In addition, the names of three other officers who worked at CERS and were executed were released: Brigadier General (Amid) Kanan As'ad Barhoum (العمید کنان اسعد برهوم), Brigadier General (Amid) Muhammad Abd al-Qadader Khaluf (العمید محمد عبدالقادر خلوف), and Colonel (Aqid) Ihsan Aqel a(l)-Rifa'i (العقید إحسان عقل الرفاعي).



Above: Major General Badia Ali Khadur

On February 27, 2023, it was reported that a colonel ("Aqid") in the Syrian army named Ibrahim al-Muhammad, a professional engineer, was murdered in an explosion in his car on the outskirts of Damascus. He was involved in the Syrian army's chemical weapons program as part of the CERS Center activity. He also produced barrel bombs and improvised chemical weapons used in the Ghouta a-Sharqiya chemical attack. It is believed that the Assad regime assassinated him to cover up the link between the regime and the war crimes.



Above: Colonel Engineer Ibrahim al-Muhammad.

Will the Assad administration continue to "tie up loose ends," hoping that Western and moderate Arab countries will resume relations with it, particularly after the earthquake disaster (February 6, 2023), and in the latter's goal to push the Shiite axis out of Syria? After all... Syria was admitted to the Arab League in May 2023...

## **Appendix D: The Iranian Involvement in the CERS Center:**

CERS maintains working relationships with Russian, North Korean, Iranian, and Syrian consultants, scientists, and experts. Many of the scientists and specialists are Iranian as a result of the Iranian "takeover" of the CERS Center.

In a July 2015 discussion with a CERS defector employee (described above in Appendix A - Establishment and History), the employee stated that all CERS initiatives are overseen by Iran. Indeed, there has been a lack of trust in the center's Syrian staff since Iranian engagement in CERS intensified in the early 2000s, particularly since 2006.

Since the start of the Syrian civil war in 2011, Iran has strengthened and expanded its involvement in all missions of the CERS Center, eventually taking control and supervising all that transpires there. According to the defector, following the Second Lebanon War (2006), the primary projects at CERS were carried out for Hezbollah (mostly the precision missile project and potentially even the conversion of outdated rockets to precision rockets).

Certain projects, particularly at Institute 4000 (Sector 4), are currently under direct Iranian supervision by senior IRGC Quds Force officers. Sector 4 is led by Asaf Diab (who succeeded Dr. Aziz Asbar, who was slain in May 2018 by unknown individuals). Khader Hamdan is its head security officer, and they maintain close communication with key Al-Quds Force members. Dr. Asbar led Institute 4000 from 2013 to 2018, as well as the Syrian missile program.

On behalf of Iran, Ali Nirouzi, chief of the IRGC's technology and logistics section, and Abu Ali Massoud Nakbat are in charge. They communicate with Bassam Merhaj al-Hassan, a senior adviser to President Bashar Assad, but operate directly with Institute 4000.

Note - As of this writing, it is unknown whether the individuals mentioned are still operating in the mentioned positions.



Above: Dr. Aziz Asbar

## **Appendix E – Support for Hezbollah:**

**The Iranian-led hardline Shiite axis includes the Assad administration. When it comes to its military engagement throughout the civil war, Hezbollah is heavily involved in what is happening in Syria. Hezbollah is responsible for the Assad regime's survival, among other things.** Hezbollah and the Assad administration have strategic cooperation. The likelihood that the Syrians provided Hezbollah with a significant number of weapons, some of which are regarded as modern conventional weaponry (the majority of them being built in Russia or based on Russian knowledge), is very high. In addition to other weaponry, this alludes to long-range ballistic missiles, anti-ship missiles, most likely Yakhont missiles, SA17, and SA22 anti-aircraft batteries.

Realistically, it's possible that chemical weapons will also be delivered to the Lebanese terrorist group, which threatens its neighbors, especially Israel. Under the direction of Iran or Syria, Hezbollah will be able to employ chemical weapons or chemical agents.

It is possible that Hezbollah may employ chemical weapons against Israel in the upcoming conflict. In one of the sites of the CERS Center in the Masyaf region, it's probable that missiles or rockets armed with chemical weapons (such as Sarin nerve gas) are kept there for use by Hezbollah. They will be provided to Hezbollah in Lebanon on demand to be put to use when seen fit. In any event, it cannot be ruled out that Hezbollah will use a chemical weapon (available, basic, or rudimentary) in the upcoming conflict with Israel. According to our assessment, Hezbollah most likely has mortar shells and rockets meant for this purpose, and Syrian expertise is likely used to arm and operationalize them.

**As mentioned, prominent members of the IRGC's Al-Quds Force are directly overseeing some initiatives in the present, particularly at Institute 4000.** For instance, Iran conveys technological equipment for the purpose of the precision project, which is intended to make these missiles accurate, while producing M-600 / Fateh-110 missiles that are planned for transfer to Hezbollah.

It's also probable that work on the Iranian "Labaik" project, which aims to modernize and improve the accuracy of outdated Iranian rockets, is being done at the CERS Center/Institute 4000. In this project, the rockets are equipped with a multitude of sensors and remote guidance systems that allow complete control of the rocket after launch. The rocket engine itself is also physically changed.

Regarding the supply of weapons to Hezbollah, a CERS defector asserted that since 2006, the majority of the manufacturing at the CERS center has been for Hezbollah and has been overseen by Iran. The defector claims that Hezbollah received chemical weapons in 2012.

**Following are the words of the CERS employee defector, updated July 2015:**

*"The arms transfers to Hezbollah in Lebanon [began] in the past ten years, or after the Second Lebanon War in 2006, [and since then] most of the production at CERS has been for [arming] Hezbollah. Under Iranian supervision, of course. In 2012, we heard that chemical weapons had been transferred to Hezbollah in vegetable refrigerators. I don't have precise data on the nature of chemical weapons, and I don't believe that any of the Institute's employees know this exactly, because the person in charge of such a transfer is a team composed of Hezbollah operatives, [Syrian] Air Force intelligence, and members of the group responsible for the [chemical] project."*

*"Most of the projects [at CERS] are carried out under Iranian supervision, and some of the laboratories are entirely Iranian-made. At the beginning of the revolution [civil war], the Iranians brought with them UAVs to monitor the 'revolutionaries' [opposition elements], and they carried out these surveillance operations in cooperation with scientists and CERS employees. In recent times [from 2015 onwards], their presence has increased in a way that has even disturbed officials and researchers, and they have become responsible for the experiments and carrying out the tasks. This can be explained by the fact that the regime trusts the Iranians more than the scientists who spent their best years at CERS. Iranians have been present at CERS for ten years or more [2005 and earlier], but with the outbreak of the revolution, the work became more intensive and it also underwent a change. They [the Iranians] began to supervise everything and also moved in with their families in designated sites, the exact number of which cannot be determined. Iranian involvement is not limited only to chemical [weapons], but also to all CERS missions. [Under Iranian supervision], rockets or components used in the manufacture of rockets (the precision missile project) began to be transported on civilian planes to the international airport in Damascus, and from there to Hezbollah and military outposts. The Iranians play the role of experts at the institute, not the military command echelon; They are a guiding rank. In my opinion, the Syrian regime will eliminate all scientists who are not loyal to it from among the other sects, and it has already begun carrying out assassinations and kidnappings."*

**Given that the Iranians have strengthened their cooperation in the CERS facility in recent years, programs at the facility are aimed for both use by the Syrian army and to support Hezbollah, with a focus on missiles - the precision project and UAVs. The CERS Center installations function as Hezbollah production plants, guided and supervised by Iranian expertise.**



## **Appendix F – The CBW: Major Attacks on CERS Center Sites:**

CERS Center sites have been targeted numerous times in recent years. This is due to the fact that they are believed to be involved in the research, production, and storage of weapons under Iranian supervision, as well as in the chemical context. These assaults have not been acknowledged by Israel.

The airstrikes are intended to disrupt the infrastructure and operations along the Iranian corridor to Syria and Lebanon. The CERS Center installations, which manufacture and store modern conventional weaponry for the Shiite axis in general and Hezbollah in particular, are an essential aspect of the Iranian corridor's infrastructure and activities in Syria. Indeed, according to Iranian plans, the deployment of CERS Center sites will allow the Iranians to "save" the shipping of some of the whole weapons systems from Iran to Syria by assembling/manufacturing them on Syrian soil.

On January 31, 2013, an attack targeting advanced surface-to-surface systems delivered to Hezbollah hit one of the CERS Center's storage facilities near Jamraya.

On September 6, 2017, an airstrike targeting a missile manufacturing plant hit one of the CERS center's production facilities near Masyaf, west of Hama. According to numerous claims, this facility also created chemical weapons.

On April 14, 2018, the United States, the United Kingdom, and France launched an attack on a variety of targets in Syria. This was in retaliation to the Douma chemical assault. CERS Center facilities used to produce and stockpile chemical weapons at Barzeh, Jamraya, and Homs were destroyed during the combined offensive.

Two facilities and weapons stockpiles were targeted on April 29, 2018, one in Aleppo province and the other in Hama governorate. The locations were presumably used by the Iranian Quds Force and were most likely linked to the CERS Center. The strike reportedly killed between 26 and 40 military people, including 11 to 19 Iranian soldiers, and destroyed a substantial amount of ammunition.

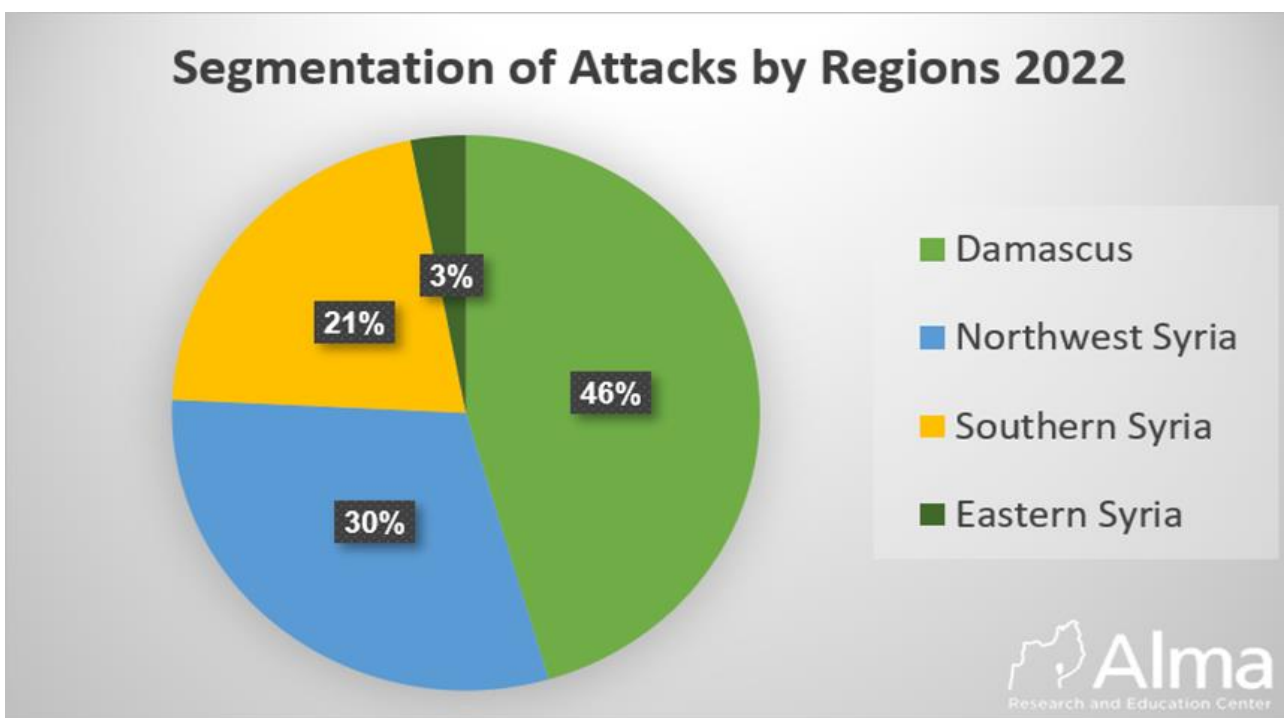
On May 5, 2021, an airstrike was reported in Masyaf and the Al-Hafah neighborhood near Latakia. In the past, Israel has been blamed for attacks on Syria's Masyaf region. A plant for the production of surface-to-surface missiles was destroyed there, according to ImageSat International (ISI), a satellite and information solutions company. Based on open-source allegations, the report stated that four locations allegedly used to store rocket parts and warheads were destroyed (perhaps as part of the CERS Center's precision missile project).

Foreign sources stated on June 8, 2021, that Israel had targeted two sites, one near Damascus and the other near Homs. These are believed to be chemical weapons installations and depots, according to the report.

On November 8, 2021, foreign sources stated that Israel had targeted two installations along the Syrian coast, one near Homs and the other near Latakia.

[According to our research of all CBW assaults in 2022](#), 76 percent of the airstrikes took place in Damascus and northeastern Syria, where CERS central sites are located. 15 airstrikes (46 percent of total) were carried out in the Damascus area, while 10 airstrikes (30 percent) were carried out in northwestern Syria. At least six attacks were launched against CERS Center sites. The remainder of

the airstrikes in these regions targeted airports and warehouses near the CERS Center. According to our evaluation, several of the warehouses are associated with CERS Center activity, either indirectly or directly. Both of these regions are home to CERS Centers, where weapons are manufactured, improved, and stored. The airstrikes, which struck hangars, warehouses, and buildings at CERS Center facilities like as Jamraya and Masyaf (Institute 4000), targeted sites where Hezbollah's advanced conventional weapons are developed and stored.



Aside from the production infrastructure at the 4000 Institute site in Masyaf, there is a storage infrastructure both within the Institute and in the geographical area of Masyaf and west of it towards the Syrian coast.

East-west Highway 54 connects the Masyaf region to the Syrian coast and the port city of Tartus. The route runs through a mountainous area west of Masyaf named by locals Khair Abbas, then continues west to an area known as Wadi Ayoun and then on to the coastal city of Tartus. It is quite likely that vehicles of various types linked with Institute 4000 travel down this road, some of which will be carrying components necessary for the construction of missiles to the Institute / ready-made weapons components from the Institute / to storage sites. Furthermore, we are familiar with a mechanism through which weapons are supplied to Hezbollah in Lebanon.

For example, at 0715 hours on March 12, 2023, a location west of Masyaf was attacked from the air. According to a geographical analysis of the photos obtained from the scene, we believe the assault took place in the Khair Abbas area, near the city of Masyaf to the west, where there is also a built-up compound including tunnels, the purpose of which is unknown to us. The timing of the attack (morning, daylight) is thought to be exceptional.

This is not the first time an attack in broad daylight has occurred (also in this location). In the case where the target of the attack was in the built-up area and was about to depart it, an attack at such an hour may indicate a certain urgency and an operative window of opportunity that cannot be postponed (for example, waiting for the night, which from an operational standpoint is more convenient to attack). It is likely that delaying the attack would have allowed the target to reach another location where attacking would have been more challenging.

It is possible that a target containing modern weaponry was attacked. It is also plausible that the target was the built-up compound itself, given it was part of the advanced weapons development and production infrastructure. In this situation, the complex's geographical location increases its relationship to the CERS Center.



On August 25, 2022, a massive airstrike was launched against the CERS Center in Masyaf in northwestern Syria. This is where the CERS Center's 4000 Institute is located. This and previous attacks appear to have severely damaged the production infrastructure of the 4000 Institute in Masyaf, including a large missile arsenal stored there for Lebanese Hezbollah and possibly for Shiite militias operating on Syrian territory under the auspices of the Iranian Quds Force. This site serves the precision missile project.

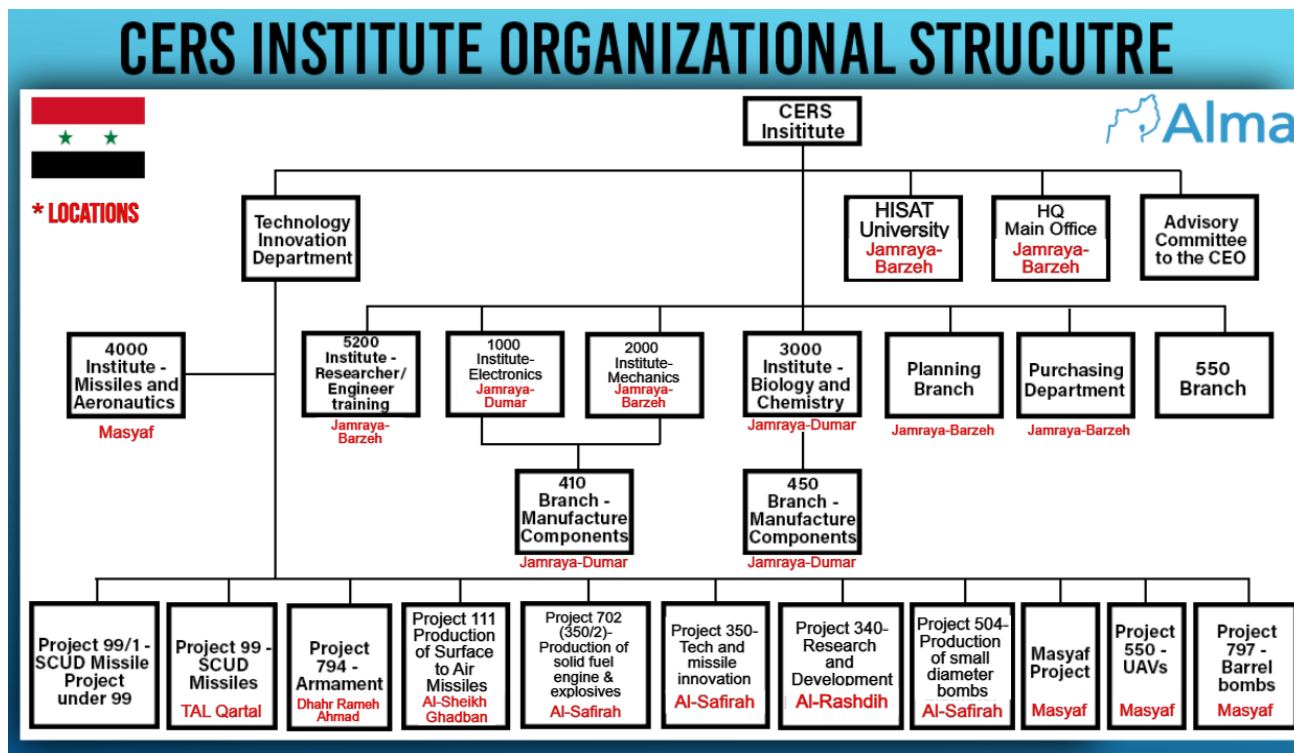
Several pieces of evidence point to an Iranian delegation arriving at the 4000 Institute in Masyaf on September 23, 2022. The context for their presence was the restoration of the Institute following recent airstrikes against it. Iranian repair efforts began on the Institute 4000 site in October 2022. The Revolutionary Guards' Hatem al-Anbiya al-Irania and Mabana al-Omran are two of the Iranian enterprises involved in the restoration of the site. These companies transferred construction materials such as cement, iron, and steel via the Banias harbor for the restoration efforts. Work on reconstruction lasted until early 2023.



On October 21, 2022, parts and components for the manufacture of UAVs imported to Syria were assembled in the Dimas neighborhood of western Damascus. This is most likely equipment that was also intended to reach the CERS center.

According to Israeli claims based on briefings from the Israeli Intelligence Directorate's Research Department, as a result of the air attacks, the Syrian military industry at the CERS Center was damaged, projects were halted in the midst, and production was brought to a standstill owing to faulty machines or individuals being injured. The Iranians were obliged to cut corners or compromise on product quality. The attacks do not halt Iranian motivation, but they do postpone and impede it.

**Appendix G – CERS Center – Organizational Structure:**



## **Appendix H - CERS Center: Sites, Institutes and Major Projects:**

### **Jamraya – Barzeh site: "Center for Scientific Research" - CERS Center Headquarters (SSRC):**

The central offices of the CERS Center are located in the Barzeh neighborhood of Damascus (Coordinates: 33.558934, 36.317674).

There are also apartments intended for employees in the center of this area. The land was previously utilized as the site of the 2000 Institute (details below).

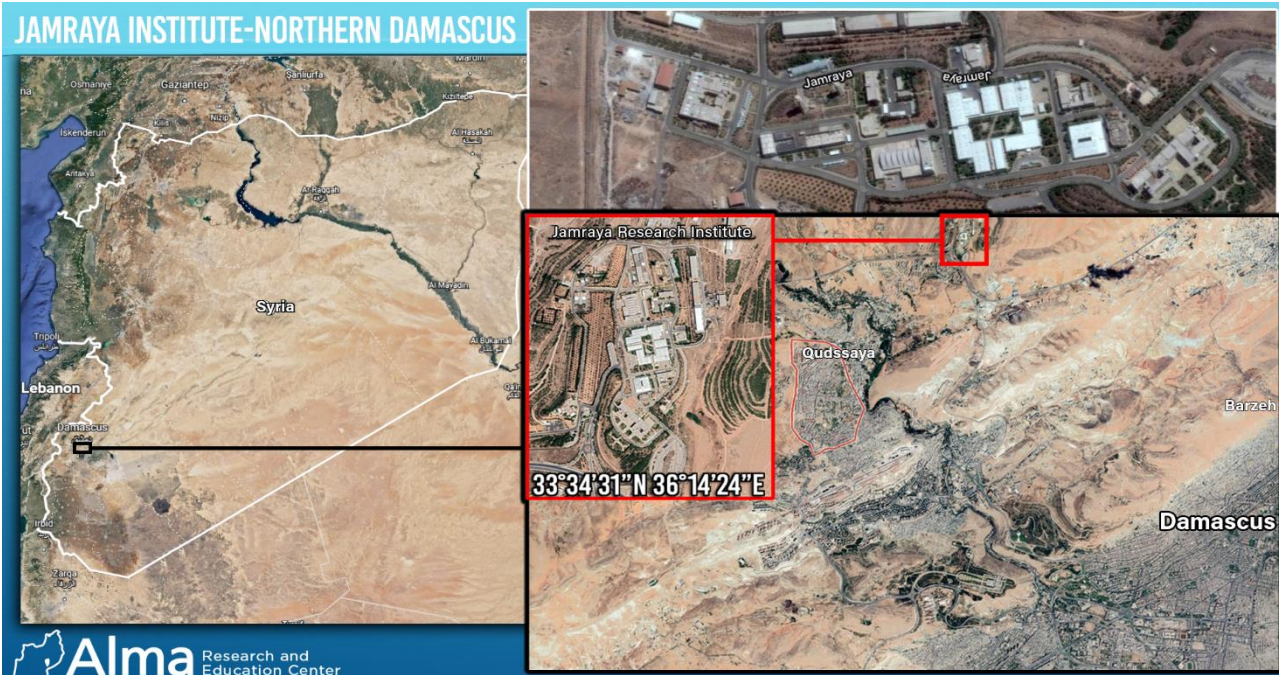


### **Jamraya Scientific Research Center – Dumar:**

The Jamraya-Dumar site lies near Mount Qasioun, northwest of Damascus (coordinates 33.5750941, 36.2391701). The CERS Center has several key institutes and branches (details below): Institute 1000, Branch 450 and research laboratories of Institute 3000, and Branch 410 of Institute 2000.

The Jamraya-Dumar site includes five main entrances, one auxiliary entrance, and potentially two more secret entrances, according to various sources. There are perhaps 51 tunnels dozens of meters underground. The tunnels are utilized for a variety of purposes, including weapon storage.

The complex covers an area of approximately 3.25 square kilometers.



**Institute 1000 – (The Electronic Institute)**

Dr. Mohammad Khaled Nasseri is the director of Institute 1000 in Dumar.

The Institute's main activity is in subterranean passageways in tunnels. The institute manufactures and develops computer systems and various electronic systems, such as navigation, guidance, signals, communications, observation, and radar equipment. Previously, the Institute housed chemical weapons in warehouses belonging to CERS Branch 450 and the 105th Brigade of the Syrian Republican Guard.

Captain Firas Ahmad leads the Institute's security bureau.

Brigadier General Tareq Yasmina is regarded as a prominent player at Institute 1000 and has complete access and knowledge of everything that occurs at the Institute.

Note: As of this writing, whether those mentioned are still in their positions is unknown.

**Institute 2000 – (The Mechanical Institute)**

Walid Zaghib is the Institute 2000's director. The Institute is located close to the CERS central headquarters in Barzeh-Jamraya and adjacent to the directorate of the Center for Studies and Higher Education. The 2000 Institute is responsible for the research, development, and mechanical manufacture of Syria's armaments programs, including missiles, mortars, etc.

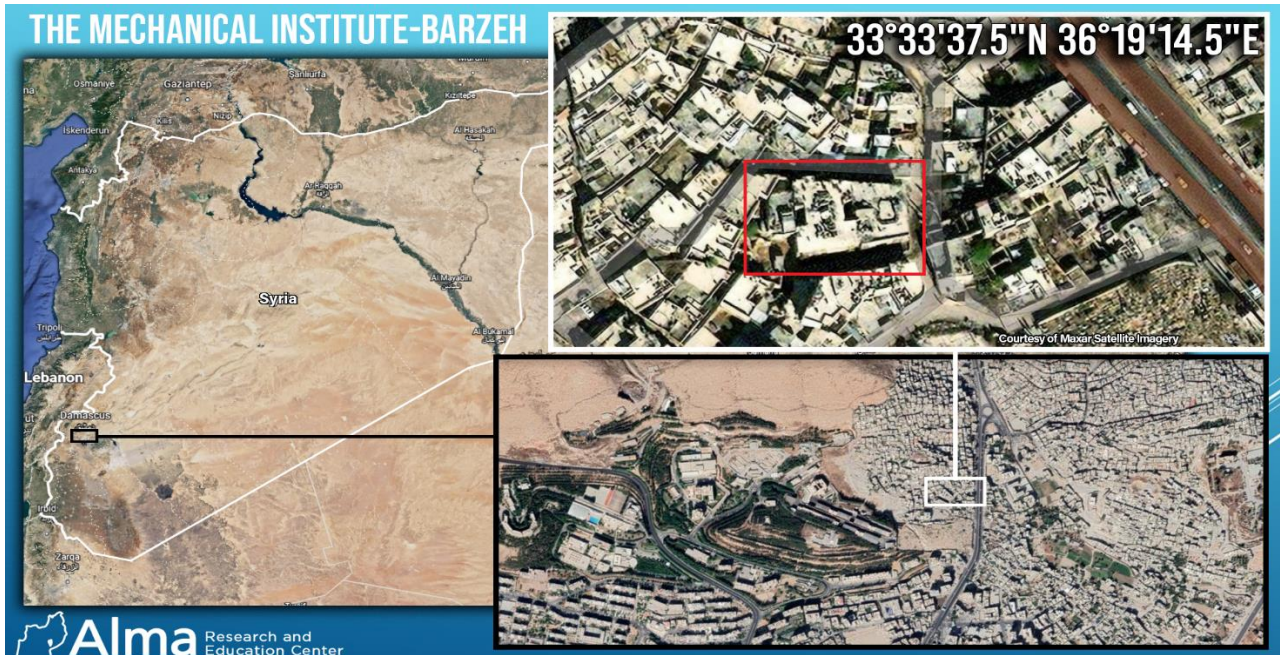
When it started, the Institute had two sections: research & development and production. Wahid al-Sheikh is the director of the research and development department. Jamil Imran is the production department's director. "Branch 410" is another name for the manufacturing division. Branch 410 began operations in 2001 and has collaborated extensively with international specialists, hosting delegations from Iran and North Korea on multiple occasions. Branch 410 is located in Dumar on its own.

In 2011, Institute 2000 began supplying the Assad regime with weaponry for use in the Syrian civil war. As previously stated, the 2000 Institute began manufacturing barrel bombs in 2013. The barrel bomb project was also carried out in collaboration with Institute 4000's project 797 (see below). Institute 2000 also began upgrading naval mines and recycling outdated chemical-carrying bombs and rockets. As previously stated, as part of the warfare, the Syrian regime launched tens of thousands of barrel bombs on population centers.

Institute 2000 also manufactured long- and short-range rocket and missile launchers, including Al-Burkan rockets (rocket variants of barrel bombs) used on August 21, 2013, in the Sarin gas attack in eastern Ghouta.

It was previously claimed that the institute also produced car bombs for assassinations within Lebanon.





Note: As of this writing, whether those mentioned are still in their positions is unknown.

### **Institute 3000 – (The Chemical Institute)**

Institute 3000 is in charge of developing and manufacturing chemical warfare agents, including precursors and activators. Most of the Institute's operations are carried out from hidden bases distributed around Syria. Many of them were discovered in the highlands or underground. The Institute 3000 laboratories are located in Jamraya at the Dumar site. The Institute's name was changed twice: once to Institute 5000, allegedly following the 2013 chemical attacks, and again to Institute 6000. The present name of the Institute is unknown.

Dr. Zuheir Fadhlon led the Institute until 2016, when he left to become director of Dimas Pharmaceuticals, Syria's largest pharmaceutical company. In 2017, this company signed a chemical supply contract with the Institute. Dr. Saeed Said, who worked as the security supervisor of Institute 3000 alongside Fadhlon, was another significant person at the institute.



Dr. Zuheir Fadhlon

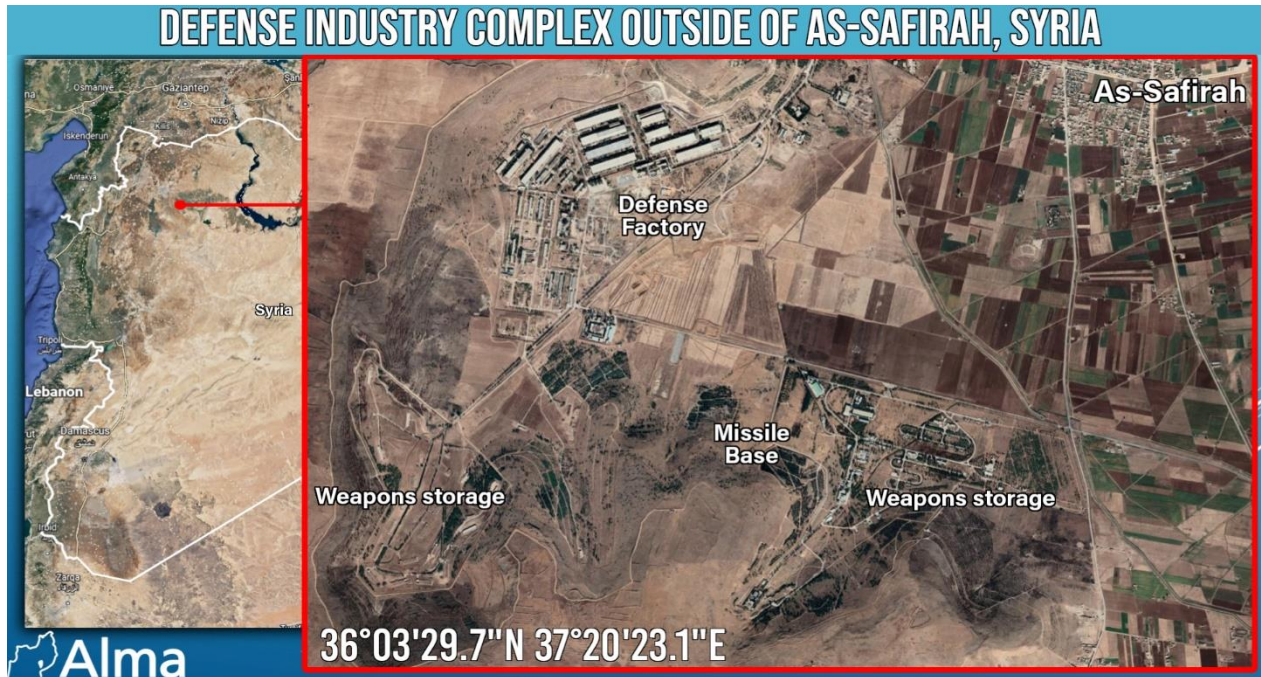
Branch 450, which operates from the Dumar location, is one of the CERS Center's most important sections and is part of the 3000 Institute. Most of its operators are military professionals, and Brigadier General Ghassan Abbas of the Air Force Intelligence Security Branch serves as its director. Due to the very sensitive and classified operation, this section is directly overseen by Assad's presidential palace. It is responsible for storing, processing, and assembling warheads with chemical agents in preparation for an attack.

Brigadier General Ghassan Abbas, head of Branch 450, supervised and directed the chemical strike at Al-Ghouta al-Sharqiyah, with the support of Ali Vannous, the commander mediating between the Republican Guard's 105th Brigade and the CERS Center.

Note: As of this writing, whether those mentioned are still in their positions is unknown.

### Details regarding the locations of chemical weapons storage facilities:

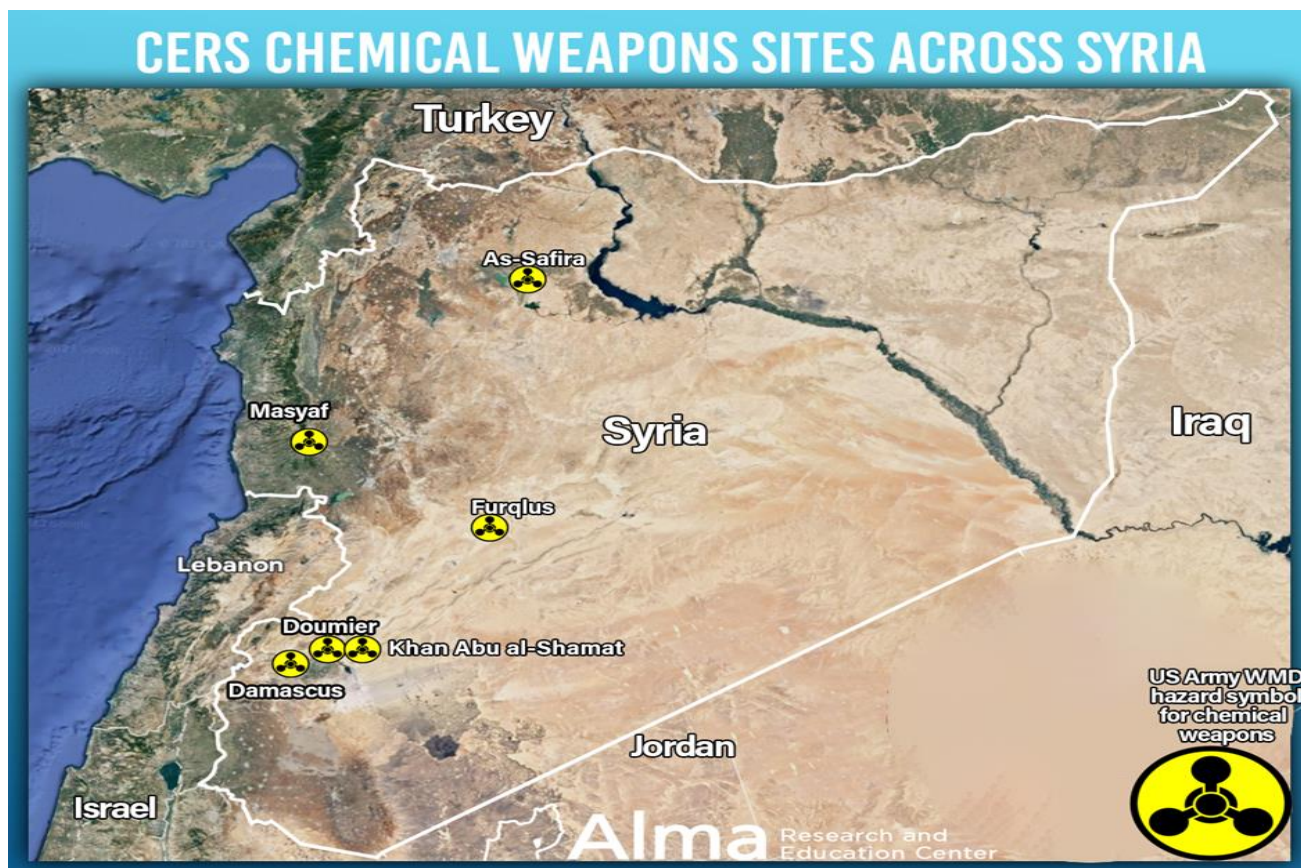
1. As-Safirah - a location 20 kilometers southeast of Aleppo (the "Defense Industry Complex") where many identified CERS center sites operate. Some of the installations, which are part of the Iranian corridor infrastructure, might have been attacked between May 1 and 2, 2023. The site was considered one of the main activity areas at the CERS Center until the outbreak of the civil war for the production, storage, and integration of chemicals into weapons, including Sarin gas (it is unclear whether it returned to operation as a chemical production site after being evacuated during the civil war, but it may have returned to use as a storage place for chemical substances).



2. Khan Abu al-Shamat - 20 km east of Dumar (It is possible that the Khan Abu al-Shamat area accommodates unidentified CERS Center).  
Another place called Abu Al-Shamat is in the center of Damascus in a completely civilian environment (coordinates, 36.30060197842089, 33.50802960819953). It is not clear if both places are related to the storage of chemical weapons, or only one of them.
3. Dumar - 40 km northeast of Damascus (It is possible that the Dumar area accommodates unidentified CERS Center).
4. Furqlus - 40 km southeast of Homs (It is possible that the Furqlus area accommodates an unidentified CERS Center). Coordinates 34.602781308138304, 37.08561659719805)
5. Masyaf - (There are identified sites of the CERS Center in the Masyaf area)
6. Damascus: Jamraya – Dumar - (There are identified sites of the CERS Center in the Jamraya – Dumar area).

Note: According to a video article from August 2020, the "Defense Industry Complex" facility in As-Safirah has resumed operations. The article reviews the civilian activities performed in the compound, which provides a source of income for many residents from Aleppo, Damascus, and Latakia. Electrical circuits and goods for household gas and water infrastructure are examples of civilian destined products.

In addition to civilian production, the facility is claimed to produce several defensive components used by the Syrian army throughout the civil war. During the civil war, armed employees from the complex arrived and guarded it while manufacturing was in progress.



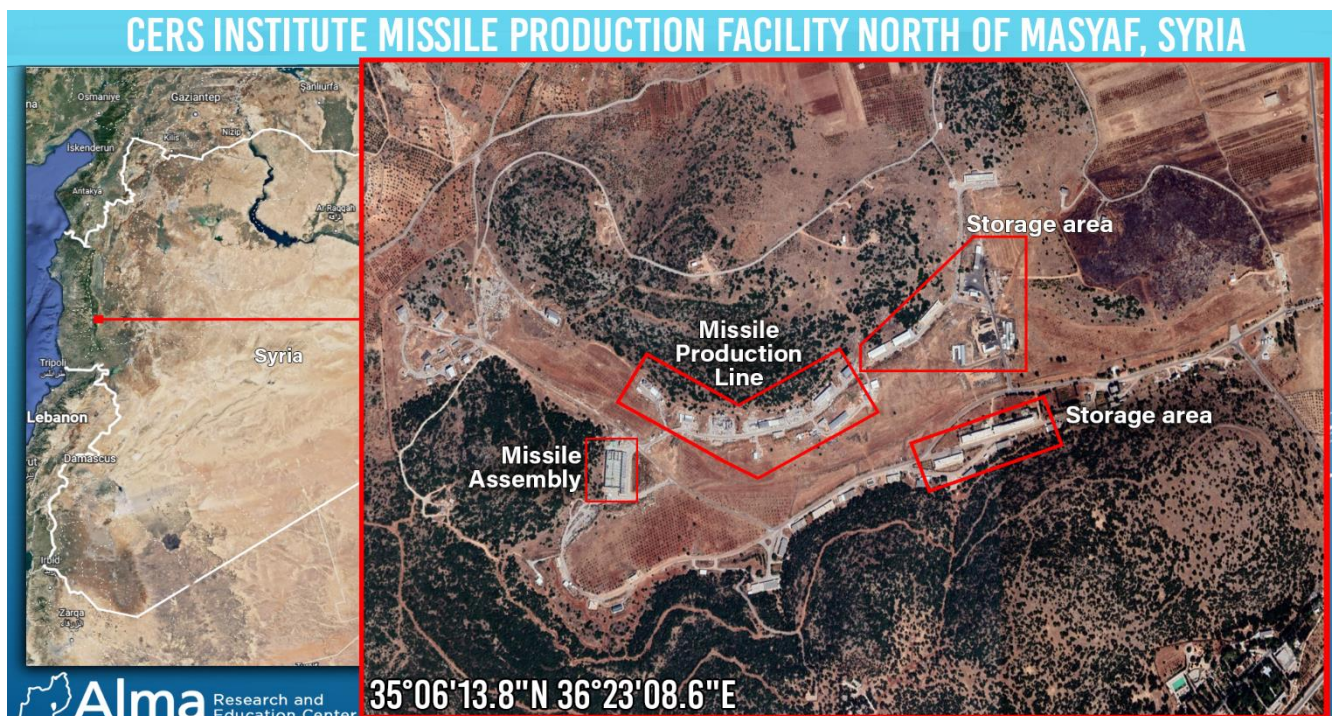
**"Institute 4000" - sector number 4 (scientific research center in the northern and central region):**

Institute 4000 was first constructed outside of Aleppo's As-Safirah district (see above). After the Syrian opposition advanced toward the city in 2012, the site was evacuated and relocated to Masyaf and Hama. Following the evacuation of the Aleppo facility, regime forces dropped numerous bombs on it in order to utterly destroy it and prevent the revealing of military secrets. Today, Institute 4000 spans a broad region, including parts of the Masyaf Center and the city of Mahrusah.

Institute 4000 has locations throughout Masyaf (a-Sheikh Ghaban, Wadi Jahnem, Tala'a al-Baath, and Dhahr Rameh Ahmad). The 4,000-person Institute employs Iranian, North Korean, Syrian, and even Lebanese Hezbollah scientists overseeing Hezbollah's precision missile project.

Atsaf Diab is the director of Institute 4000. Hithr Hamdan is the security officer. They are in contact with senior members of the IRGC's Quds Force. Institute 4000 is in charge of producing precision missiles (long-range ballistic missiles / surface-to-surface) and rockets, including anti-aircraft missiles and unmanned aerial vehicles (UAVs). The institute is in charge of the activities of departments in northern and central Syria, as well as along the coast. The institute is also in charge of manufacturing vacuum bombs, fuel/phosphorus/cluster bombs, and rockets (details below).

Note: As of this writing, whether those mentioned are still in their positions is unknown.

**Institute 4000 – Masyaf base - Missile Manufacturing Facility:**

**Main branches of the 4000 Institute:****"Branch 340":**

Al-Rashdin is located in western Aleppo. This section contains the missile research and development department and the mechanical application branch, which manufactures mechanical parts for most of Aleppo's projects.

The branch operates hundreds of cutting-edge devices, with the majority of the equipment being relocated to the coastal industry after Syria's civil war began.

Engineer, Nasser Mohammad, is in charge of the production department. Jamal Rihawi, who fled Syria, was one of the branch's defectors.

**"Branch 350":**

It is located in eastern Aleppo, in the Al-Safirah district, and has two departments, one for mechanical production and the other for assembling missile components and parts.

**"Branch 350/2 or Branch 702":**

Located near the village of Zinan in the As-Safirah region.

Its director may be Nasser Muhammad (an engineer from the town of Khirbet al-Fares/Tartus).

Specializes in the development of various types of missile fuels, such as the ammonium perchlorate production project, as well as the ability to transport all components to the Syrian coast.

Note: As of this writing, whether those mentioned are still in their positions is unknown.

**Major projects under the responsibility of Institute 4000:****"Project 111":**

An inactive project that was carried out in collaboration with the IRGC. Its construction started in 2013. The project was located a few kilometers northeast of Masyaf in a location known as al-Sheikh Ghadban (الشيخ غضبان), which was bombed from the air multiple times, roughly 25 kilometers from the Wadi Jahnem area (وادي جهنم).

Dr. Aziz Asbar (director of Institute 4000 and former leader of the Syrian missile program, who lost his life in 2018 from a roadside bomb near Wadi Jahnem) headed the missile research, development, and upgrading complex there.

There was a supply line of medium- and long-range missiles between these two areas, Sheikh Ghadban and Wadi Jahnem. It is quite difficult to uncover information about Project 111. However, based on our limited information, it was an unsuccessful project that was terminated in 2016.

**"Project 504":**

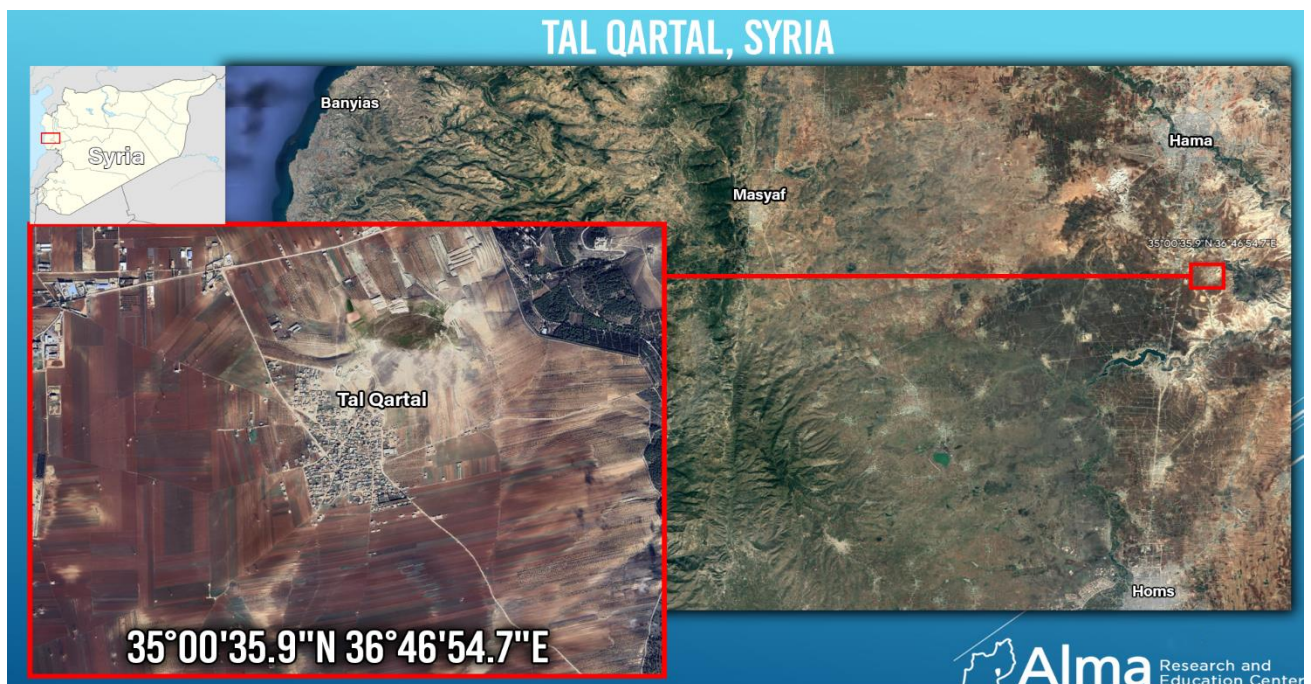
Situated in As-Safirah.

Specializes in the production of small bombs.

**"Project 99":**

The project is based at the CERS Center in Tal Qartal, around 35 kilometers north of Homs and 18 kilometers south of Hama. Most of Project 99, which manufactures ballistic missiles in collaboration with Iranian and North Korean experts, is based there.

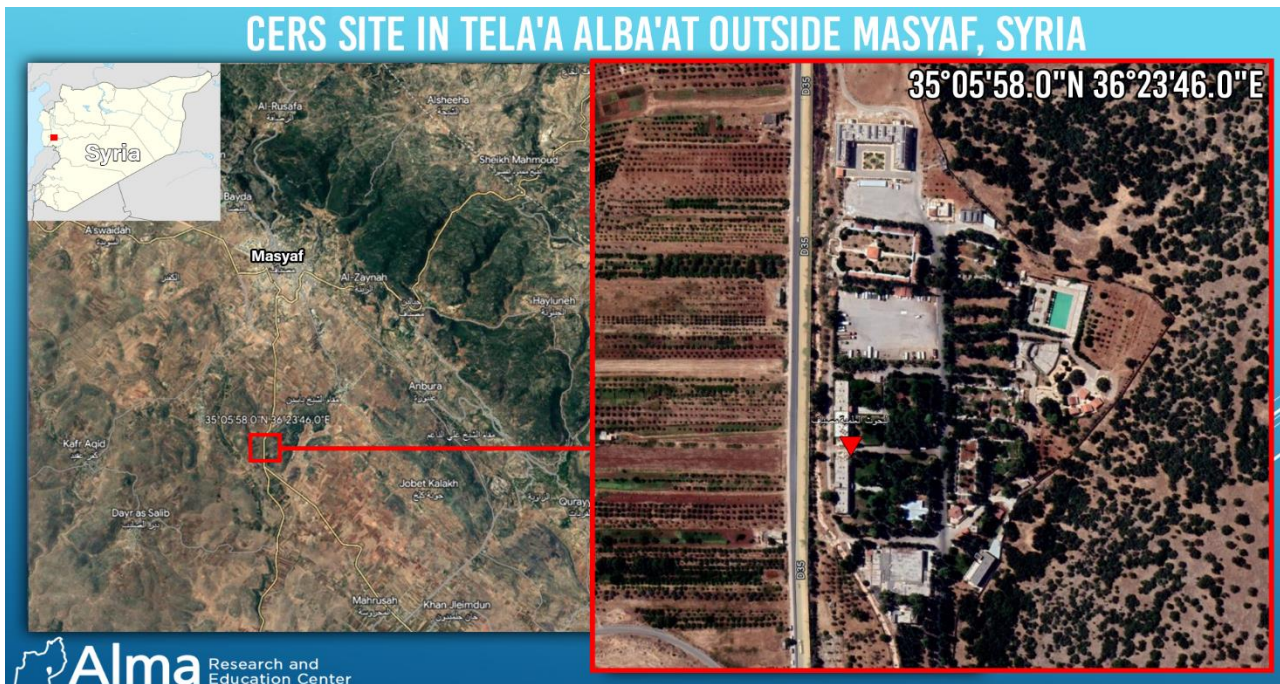
Dr. Mahmoud Ibrahim (from Rif Dimashq) founded the project and served as its first director. He holds a Ph.D. in mechanical engineering and is known as the "Father of Syrian Ballistic Missiles." He then became the CERS Center's planning director before being slain at the center's entrance in 2015. One of the senior individuals in the project is Nidal al-Atassi. (note: as of this writing, it is unknown if he is still in his position).

**"Project Masyaf":**

The project began in 2006, near the Al-Makhasbeh school, in the Tala'a al-Baath base.

It aimed to manufacture shoulder-fired anti-aircraft missiles based on the Russian "Igla" missile design.

Its director, Dr. Ali Suleiman (note: it is unknown if he is still in his position as of this writing).



### **Branch "550":**

Specializes in research and development of UAVs, drones and special weapons.

### **"Project 794":**

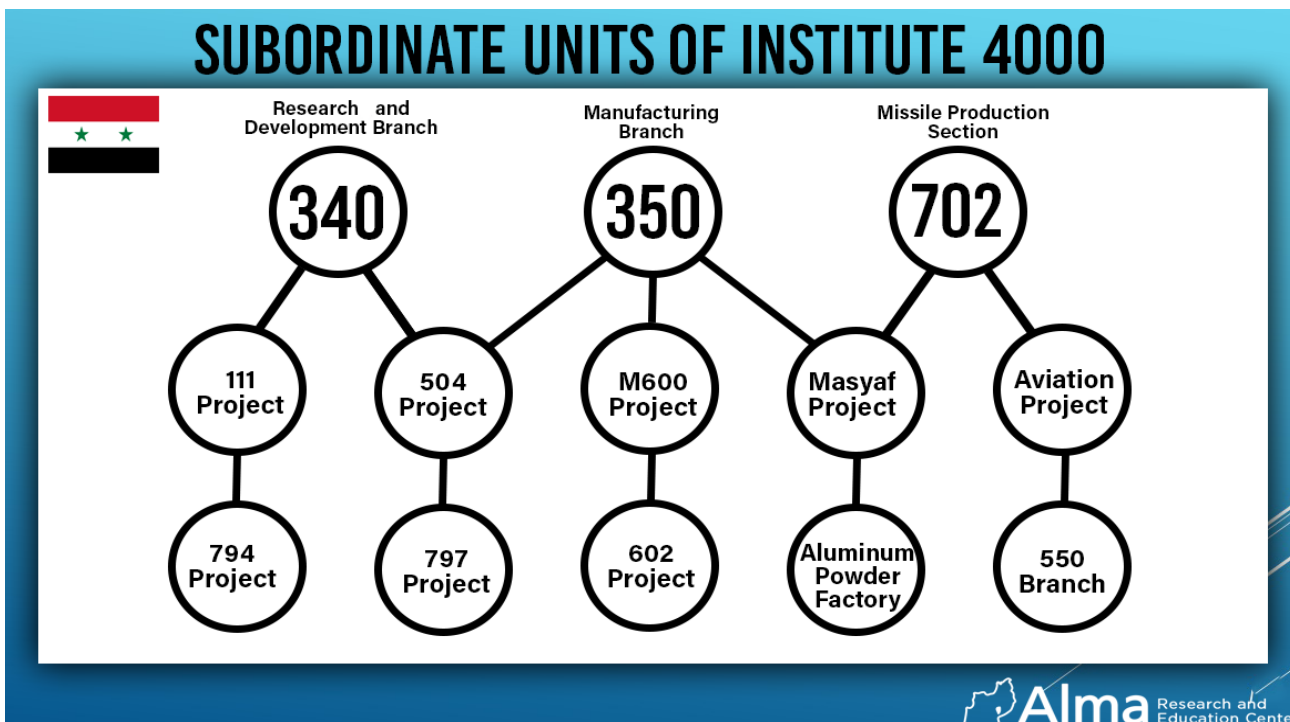
Project 794 operates in an area called Dhahr Rameh Ahmad (ضهر رامة أحمد), northwest of Masyaf, (Coordinates: 35.151664052917525 ,36.26434944323055)

It is unclear what the purpose of the project is. It is possibly engaged in the manufacture of munitions (the type of armament is unclear).

### **"Project 797":**

Manufacturing facility for explosive and chlorine barrel bombs. Project 797 (also known as "Factory 797" and earlier known as the "Buraq Factory") is part of Institute 4000 and is located near Masyaf. This project was only recently discovered. As previously said, it is a member of another project dubbed "410" that is part of the 2000 Institute in the Jamraya area. Both projects are workshops for the manufacture of chlorine-laced barrel bombs.

In 2013, the US Secretary of State expressed concern that suspicious nuclear activity was being conducted at this factory, as well as units for manufacturing biological and chemical warheads. According to several sources, regime opponents blew up the factory that year (the integrity of these reports is unclear).



**Institute 4000's precision project (impact radius of up to 10 meters):**

M600 ground-to-ground ballistic missiles based on the Russian Luna missile were developed jointly with Iran (which manufactures the Fateh-110 missile).

Their precision project with Iranian scientists is Scud 275 with a 600mm diameter.

'Shihab 1', 'Shihab 2', 'ODAB,' Zelzal, and Fajr are other examples.

Project T: Redevelopment of a Tochka-class Russian surface-to-surface missile. The plan is to introduce precise components over a 70-kilometer distance.

Institute 4000 may also be working on the Iranian "Labaik" project, which aims to modernize outdated Iranian rockets by adding a number of sensors and remote guidance systems, enabling full rocket control after launch. The rocket engine has also been physically modified. Originally, it had three typical fins, but they were replaced with Russian-designed R-27 missile fins, and the computer is housed between the hull and the combat warhead; after these changes, the rockets were dubbed "Labaik1."





These are Naze'at rockets (the destroyers) which were first employed in the 1980s during the Iraq-Iran war and were later temporarily deployed by the Iranian army and the IRGC's ground forces until more precise missiles were developed. These rockets were produced in 10 variants, each powered by solid fuel and with ranges ranging from 90 to 125 kilometers.

The tenth and most recent version comes with a range of 125 kilometers, a length of 8.03 meters, a diameter of 45 cm, a warhead weighing 240 kg, and a total weight of 1830 kg.



[The following is an Iranian video that explains the rocket upgrade project \("Labaik 1"\) and the first test of the rocket after its conversion on December 5, 2018 during the Prophet Muhammad holiday events.](#)

#### **Additional weapons manufactured at Institute 4000:**

Vacuum/fuel bombs - developed in Branch 350 in Al Rashidun, it is estimated that approximately 1,000 such bombs were produced by Branch 350. Transferred to Masyaf for production.

Grad 122, Organ 220, and Smerch 300 rocket launchers and rockets are capable of being launched through several barrels/launchers to a distance of around 100 kilometers.



Grad 122



Organ 220



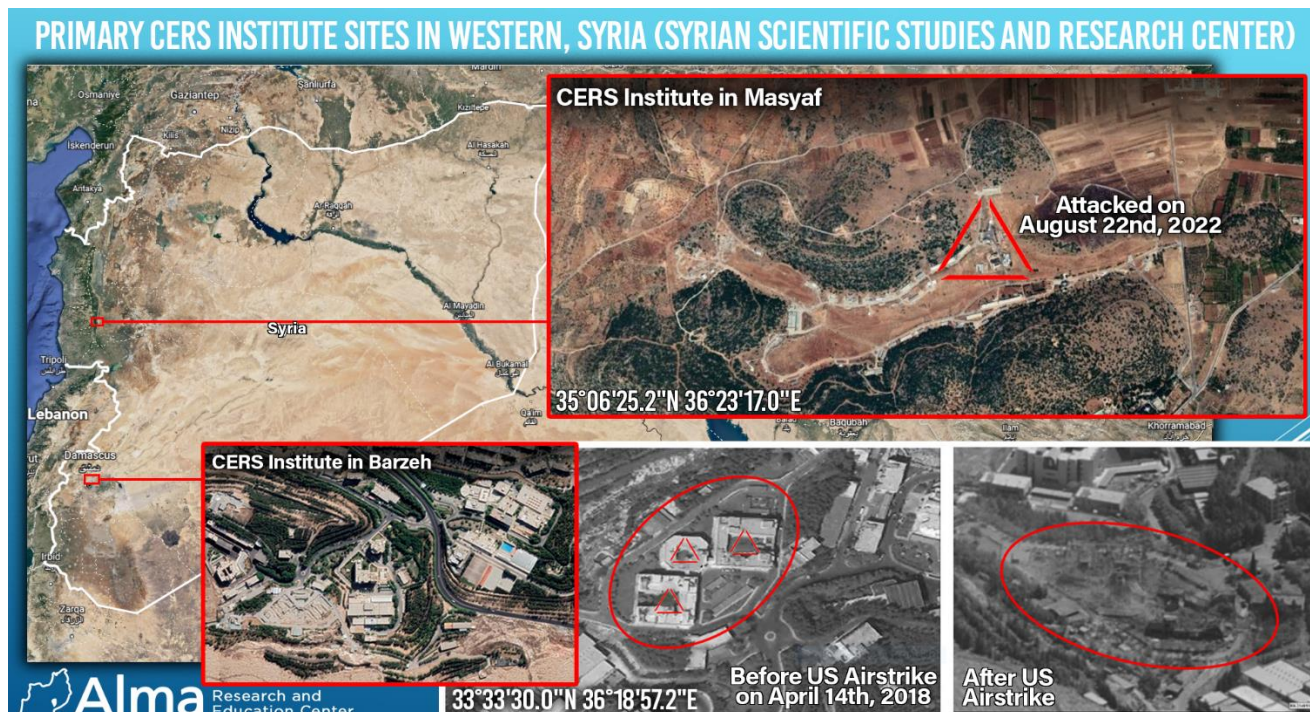
Smerch 300

Phosphorus bombs were once made in the As-Safirah facility as part of the Al Rashidun Center. Engineer Hashem al-Sheikh ("Abu Jaber"), who defected and became commander of the rebel movement Ahrar al-Sham al-Islamiyah (Jaish al-Ahrar), was its former director. The bomb manufacturing line was transferred to Masyaf.

Cluster bombs are manufactured at the Masyaf branch.

**Another branch of Institute 4000 operated at the Barzeh Research Facility,**

(Coordinates: 33.557500, 36.315833). The site was targeted from the air multiple times, including by the US in April 2018 (after the Assad regime's chemical assault in Douma) and again in September 2022, when it was entirely destroyed.



### **Institute 5200 (Supreme Institute of Applied Sciences)**

Located in Jamraya-Barzeh.

The Supreme Institute of Applied Sciences is where scientists, researchers, and engineers are trained before being sent to complete their professional training in one of Europe's, Russia's, or Iran's countries.

### **Scientific centers associated with the CERS Center:**

**The Higher Institute of Applied Science and Technology (HIAST) (also appears by its initials ISSAT)**



**(NSCL) National Standards and Calibration Laboratory:**

Year founded: 1987

Phone: +963115116477

Fax: +963115117539

Email: [nscl@nscl.sy](mailto:nscl@nscl.sy)

The NSCL was identified as an extension of the CERS Center on July 23, 2014, and was automatically placed on international sanctions lists.



### **Appendix I: Individuals and companies affiliated with the CERS center regarding procurement issues and mapping sanctions:**

Company / Individual Name	Summary	Sanctions
ABC Shipping Co.	A large transportation corporation that operates on land, sea, and air. The company has two offices: one in Beirut and one in Istanbul. Sami Blot is the company's CEO.	No sanctions were found against the companies or the CEO.
Aziz Allouch - Not Found		
Mireille Chahine	Lebanese woman from Beirut, born 83. Accountant at Electronic Katrangi Group.	Office of Foreign Assets Control (OFAC).
Denise Company - Not Found		
EKT SMART TECHNOLOGY CO., LTD	A Chinese-British corporation that manufactures new media and Internet technology and delivers business services.	<ol style="list-style-type: none"> <li>1. The French Ministry for the Economy and Finance.</li> <li>2. Office of Foreign Assets Control (OFAC).</li> <li>3. Specially Designated Nationals And Blocked Persons List (SDN)</li> </ol>
EKT Katrangi Bros.	The corporation conducts business in Lebanon, Syria, Egypt, and France as an international e-commerce enterprise (similar to eBay). Works in tandem with CERS centers.	The company is under all possible U.S. sanctions.
Electronic System Group (ESG)	Business consulting services in the field of electronics. Works in collaboration with CERS centers.	The French Ministry for the Economy and Finance.
General Organization for Engineering Industries	A state institution that oversees the administration of 13 engineering companies, including those in the electronics, electricity, and metal industries. Works in	Sanctions from every possible office in the US, Europe and the Far East.

	collaboration with CERS centers.	
GOLDEN STAR CO.	Risk management company	The company is subject to U.S. sanctions.
Houranieh Chadi, Fadi, Hwaida, Mohammad Khalil, Mohammad Nazier.	Co-owner of Nazier Houranieh & Sons Co. the company supplies all-purpose materials to the CERS Center for the production of chemical weapons.	Sanctions from the US, France, Belgium, UK
Industrial Solutions	The company is responsible for sensitive procurement for CERS centers.	Worldwide sanctions.
Joud Trading	An Emirati enterprise cultivates and trades dates and olives worldwide.	Sanctions in France.
Mohamed KASSOUM	Born in 1973 in Syria; his position is unknown.	Sanctions in France.
lumiere elysees	The French branch of EKT Electronics owned by the Katrangi family.	
Mahrous group / trading	A Syrian commerce, import, and marketing firm that works closely with CERS centers.	Numerous penalties are being levied on the business and the numerous Mahrous family members that run it.
Megatrade	A Syrian trading company that imports products for the CERS Center.	American, Canadian & British sanctions.
Metal manufacturing factory Syria	Steel production plant.	No sanctions imposed.
MKH import & export Syria	No existing information.	
Nktronics	A subsidiary of EKT Electronics No information regarding the company.	
Organization for technological industries	A division of the Syrian Ministry of Defense in charge of the CERS Center's chemical weapons development.	Worldwide sanctions.

Salah Habib	A 59-year-old man with Syrian and French citizenship is being held in a French prison after being suspected of importing oil and materials used to manufacture chemical weapons for the Syrian regime in order to circumvent sanctions.	Sanctions in the US and France.
Shadi for cars trading lebanon	A company for importing and trading vehicles, sanctions were imposed following cooperation with the CERS Center.	Sanctions from Australia and the United States.
sigmatech lebanon	A technology consulting company and service provider operating in several European countries.	U.S. sanctions.
smart green power	Supplier of solar energy equipment in Paris.	Sanctions of the Federal Reserve Bank.
smart logistics offshore	A subsidiary of EKT Electronics.	
smart pegasus	Wholesale trade company and subsidiary of EKT Electronics.	
steelor company lebanon	Metal protection materials manufacturing company.	No sanctions.
Syrian arab co. for electronic industries	A machine manufacturing company, working under the CERS Center.	Worldwide sanctions.
Technolab	A technology company functioning as a CERS Center's supplier.	U.S. sanctions.
yona star international	The company, owned by Salah Habib, works in cooperation with CERS.	U.S. sanctions.
zhou yishan	An Executive at EKT SMART TECHNOLOGY	U.S. and French Sanctions.

## **Appendix J - Sources:**

<https://www.tagesschau.de/ausland/syrien1850.pdf>

<https://home.treasury.gov/news/press-releases/tg1714>

<https://storymaps.arcgis.com/stories/f353d0a2893e4396b9d82b9ba5458d69>

<https://horrya.net/archives/107489>

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<https://syrianarchive.org/en/datasets/chemical-weapons>

<https://horrya.net/archives/107489>

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<https://www.alaraby.co.uk/politics/>

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<https://livingatlas.arcgis.com/wayback/#active=47471&ext=36.31618,33.55786,36.31936,33.55946>

<http://wikimapia.org/#lang=en&lat=33.558934&lon=36.317674&z=18&m=bs&search=33.55893444804582%2C%2036.31767400334847>

<https://storymaps.arcgis.com/stories/f353d0a2893e4396b9d82b9ba5458d69>

<https://livingatlas.arcgis.com/wayback/#active=47471&ext=36.31926,33.55969,36.32244,33.56128>



<http://wikimapia.org/#lang=en&lat=33.560444&lon=36.320541&z=19&m=bs&search=33.560444605973906%2C%2036.320541317377916>

<https://storymaps.arcgis.com/stories/f353d0a2893e4396b9d82b9ba5458d69>

<https://livingatlas.arcgis.com/wayback/#active=47471&ext=36.38332,35.10230,36.39604,35.10857>

<http://wikimapia.org/#lang=en&lat=35.104638&lon=36.388693&z=15&m=w&show=/19042671/Missile-Production-Facility&search=35.1046209%2C%2036.3886731>

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