



**EngineeringUK**

INSPIRING FUTURES TOGETHER



# **THE ENGINEERING AND TECHNOLOGY WORKFORCE**

September 2024 update

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# Key findings

The 2023 UK workforce using the Labour Force Survey:

- There are approximately **6.3 million people working in engineering and technology occupations** in the UK. This represents nearly one fifth (19.2%) of the workforce and is consistent with previous years.
- **There has been a worrying decline in the percentage of women in engineering and technology occupations** to 15.7% from 16.5% in 2022. In comparison, women made up over half (56.1%) of all other occupations combined.
- People working in engineering and technology occupations **earned more on average than all other occupations at £39,163.74** gross pay.
- **Minority ethnic groups were underrepresented in engineering and technology occupations at 12.4%**, compared to 16.0% amongst all other occupations.
- **18.3% of women working in engineering and technology occupations were from a minority ethnic group** compared to only 11.4% of men. Interestingly, out of all women working in engineering and technology, there were more women from Asian backgrounds (10.1%), compared to all other occupations combined (7.4%).
- **Fewer people working in engineering and technology occupations reported they had a disability** consistent with the Equality Act (13.6%) compared to all other occupations combined (18.0%).
- Those in engineering and technology occupations were **significantly more likely to have completed an apprenticeship** (20.0%) compared to all other occupations combined (6.4%).
- People working in engineering and technology were most likely to say **their place of work was in the south east of England (14.6%)** whereas for all other occupations this was London (16.1%).
- **12.9% of the UK workforce were working in engineering and technology roles in the engineering industry** (either employed or self-employed) while a further 6.2% were working in these jobs in other industries.
- Nearly **7x as many men were working in engineering and technology occupations within the engineering industry** (22.0%) compared to women (3.3%). This gap was smaller for men and women working in engineering and technology *outside* the industry (9.3% and 2.9% respectively).

# Introduction

Each year EngineeringUK provides insight into the contribution of engineering and technology to the UK workforce including a breakdown of *who* is working in these roles by key demographics. We also analyse employment by industry and occupation to look at engineering and technology in the context of the broader UK economy.

To calculate this, we use the Office of National Statistics' (ONS') latest 2023 Labour Force Survey (LFS) and our 'engineering footprint'<sup>1</sup>.

There are approximately 6.3 million people - nearly one-fifth of the UK workforce (19.2%) - working in engineering and technology occupations in the UK as of 2023. Of this number, there are an estimated 4.1 million people working in core engineering and technology occupations, such as civil engineers, environmental professionals and aerospace engineers and a further 2.1 million working in related engineering occupations such as architects, bricklayers and IT operations technicians (table 1).

**Table 1: Approximate number and percentage of those working in core and related engineering and tech occupations in the UK**

	Approximate number	% of the UK workforce
Core engineering and technology	4.1 million	12.5
Related engineering and technology	2.2 million	6.7
Total engineering and technology	6.3 million	19.2

In this report, we explore the latest data covering engineering and technology occupations before moving on to the demographics of who is working in these roles.

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<sup>1</sup> Together, EngineeringUK, the Royal Academy of Engineering and the Engineering Council established an agreed list of Standard Occupational Classification (SOC) codes which encompasses all aspects of engineering, known as the 'engineering footprint'. To find out more, click [here](#).

# UK engineering and technology occupations and industry

In this section we look at the proportion of the UK workforce with jobs in the engineering and technology industry and/or in an engineering and technology role, along with where jobs are based and how pay compares. We review the proportion of the engineering and technology workforce working in different roles including by gender.

## Engineering and technology industry

Over a tenth of the UK workforce (both employed and self-employed) were working in an engineering and technology occupation *within* the engineering industry (12.9%). A further 10.2% were working in the industry but not in an engineering or technology occupation, which might include, for example, those working in HR at an engineering or technology company.

A smaller proportion (6.2%) were working in engineering and technology roles, but within a different industry, and the remaining 70.5% weren't working in an engineering or technology occupation or in this industry (table 2).

**Table 2: Percentage working in the engineering and tech industry and/or as an engineer or technologist in the UK**

Occupation and industry	% of the overall workplace
working as an engineer in the engineering and tech industry	12.9
working in the engineering and tech industry but not as an engineer	10.2
working as an engineer in a different sector	6.2
neither working as an engineer nor in the engineering and tech industry	70.5

There are large gender differences throughout the engineering and technology workforce. Nearly 7 times as many men were working in engineering and technology roles within an engineering and technology industry (22.0%) compared to women (3.3%). Fewer than a tenth of women were working in the engineering industry, but in a non-engineering and technology occupation (8.2%), compared to 12.1% of men. In addition, more men were working in engineering and technology roles, but in a different sector (9.3%) compared to women (2.9%) (table 3).

**Table 3: Percentage working in the engineering and tech industry and/or as an engineer or technologist in the UK, by gender**

Occupation and industry	% of the workplace	
	Men	Women
working as an engineer in the engineering and tech industry	22.0	3.3
working in the engineering and tech industry but not as an engineer	12.1	8.2
working as an engineer in a different sector	9.3	2.9
neither working as an engineer nor in the engineering and tech industry	56.6	85.6

## Engineering and technology occupations

The popularity of each engineering and technology occupation also differed depending on gender. Approximately 3.5 million men working in the UK workforce worked in core engineering and technology occupations, with a further 1.8 million working in related occupations. Core engineering and technology occupations were also more common amongst women, with approximately 620,000 working in these roles and 380,000 working in related occupations (table 4).

**Table 4: Approximate number and percentage of those working in core and related engineering and tech occupations in the UK by gender**

Occupations	Men		Women	
	Approximate number	% of the UK workforce	Approximate number	% of the UK workforce
Core engineering and technology	3.5 million	20.6	620,000	3.9
Related engineering and technology	1.8 million	10.6	380,000	2.4
Total engineering and technology	5.3 million	31.2	1.0 million	6.3

The most common core engineering and technology occupation was ‘programmers and software development professionals’ at 14.9% and the most common related occupation was IT managers 10.7% (table 5). This is not surprising given previous EngineeringUK research which found that ICT and software-related jobs made up the largest portion of the engineering footprint.<sup>2</sup>

<sup>2</sup> Lightcast. (2023). *Engineering skills needs – now and into the future*. Available at: [https://www.engineeringuk.com/media/318944/engineering-skills-needs-now-and-into-the-future\\_report\\_fv.pdf](https://www.engineeringuk.com/media/318944/engineering-skills-needs-now-and-into-the-future_report_fv.pdf)

**Table 5: Top 5 most common core and related engineering and tech occupations**

Top 5 most common core engineering and technology occupations	Top 5 most common related engineering and technology occupations
<ol style="list-style-type: none"> <li>1. Programmers and software development professionals – 14.9%</li> <li>2. Production managers and directors in manufacturing - 6.8%</li> <li>3. Electricians and electrical fitters - 5.0%</li> <li>4. IT business analysts, architects and systems designers - 4.9%</li> <li>5. Metal work production and maintenance fitters - 4.5%</li> </ol>	<ol style="list-style-type: none"> <li>1. IT managers - 10.7%</li> <li>2. Construction and building trades not elsewhere specified (n.e.c) - 9.5%.</li> <li>3. Carpenters and joiners - 8.3%</li> <li>4. IT user support technicians – 7.2%</li> <li>5. Information technology directors – 6.5%</li> </ol>

Whilst the most common core occupation (programmers and software development professionals) was similar amongst men (14.7%) and women (15.7%) working in core roles, there was a stark gender difference amongst the percentage of men and women working as quality assurance and regulatory professionals. While this was the second most common core occupation for women at 11.6%, only 2.3% of men were working in the same role. An example of a core occupation more popular amongst men was ‘electricians and electrical fitters’ with a difference of 5.2 percentage points between men (5.8%) and women (0.6%) (table 6). This data indicates that men worked across a wider range of roles in engineering and technology, whilst women were concentrated in a few occupations. For instance, the percentage of women in their top 3 popular occupations accounted for 36.7% of all women working in engineering and technology, while the top 3 for men was only 26.9%.

**Table 6: 10 most popular core engineering and tech occupations, by gender**

Core Occupation	Total	Men	Women
Programmers and software development professionals	14.9%	14.7%	15.7%
Production managers and directors in manufacturing	6.8%	6.4%	9.4%
Electricians and electrical fitters	5.0%	5.8%	0.6%
IT business analysts, architects and systems designers	4.9%	4.3%	8.6%
Metal working production and maintenance fitters	4.5%	5.1%	1.0%
Vehicle technicians, mechanics and electricians	4.0%	4.6%	0.2%
Information technology professionals n.e.c.	3.9%	3.5%	6.2%
Production managers and directors in construction	3.7%	3.8%	3.0%
Quality assurance and regulatory professionals	3.7%	2.4%	11.6%
Plumbers & heating and ventilating installers and repairers	3.6%	4.2%	0.4%

There were also marked gender differences in the popularity of some related engineering and technology occupations. IT manager was the most common related occupation amongst women at 13.7%, with 10.1% of men also working in this occupation. The most common related occupation

amongst men was 'construction and building trades n.e.c' at 11.2%, however, only 0.9% of women reported working in the same role. Another occupation with a notable gender difference was 'food, drink and tobacco process operatives' which was more common amongst women at 11.2% compared to only 4.0% of men (table 7).

**Table 7: 10 most popular related occupations as a percentage, by gender**

Related engineering occupations	Total	Men	Women
IT managers	10.7%	10.1%	13.7%
Construction and building trades n.e.c.	9.5%	11.2%	0.9%
Carpenters and joiners	8.3%	9.9%	0.9%
IT user support technicians	7.2%	6.6%	9.7%
Information technology directors	6.5%	6.2%	8.0%
Food, drink and tobacco process operatives	5.2%	4.0%	11.2%
IT project managers	4.1%	3.6%	6.4%
IT operations technicians	4.1%	4.3%	6.5%
Construction operatives n.e.c.	3.9%	4.4%	1.1%
Construction project managers and related professionals	3.0%	2.9%	3.5%

## Pay

People working in engineering and technology occupations were significantly more likely to earn more compared to the average across all other occupations combined. Engineers and technologists reported an average gross pay of £39,163.74 whilst the average gross pay for all other occupations combined was £31,646.42<sup>3</sup>.

## Region

The highest proportion of people working in engineering and technology said their place of work was in the south east of England (14.6%) whereas for all other occupations the most popular region was London (16.1%), which was second among engineers and technologists (13.7%). In line with its share of the UK population, Northern Ireland had the smallest proportion of people working in engineering and technology and other occupations 2.6%), (table 8).

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<sup>3</sup> Gross pay was only available for those in employment and therefore did not include people who were self-employed



**Table 8: Location of main job, by regions in the UK**

<b>Region</b>	<b>Engineering and technology occupation</b>	<b>All other occupations</b>	<b>Proportion of overall UK population<sup>4</sup></b>
North East	3.6%	3.6%	4.0%
North West	10.6%	10.9%	11.1%
Yorkshire and the Humber	8.4%	7.8%	8.2%
East Midlands	7.0%	7.0%	7.3%
West Midlands	8.9%	8.5%	8.9%
East of England	8.9%	9.0%	9.5%
London	13.7%	16.1%	13.1%
South East	14.6%	13.5%	13.9%
South West	9.7%	8.5%	8.5%
Wales	4.1%	4.2%	4.6%
Scotland	7.6%	8.1%	8.1%
Northern Ireland	2.6%	2.6%	2.8%
Workplace outside UK	0.3%	0.1%	-

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<sup>4</sup> These proportions are as of the latest Census – 2021 in England, Wales and Northern Ireland, and 2022 in Scotland.

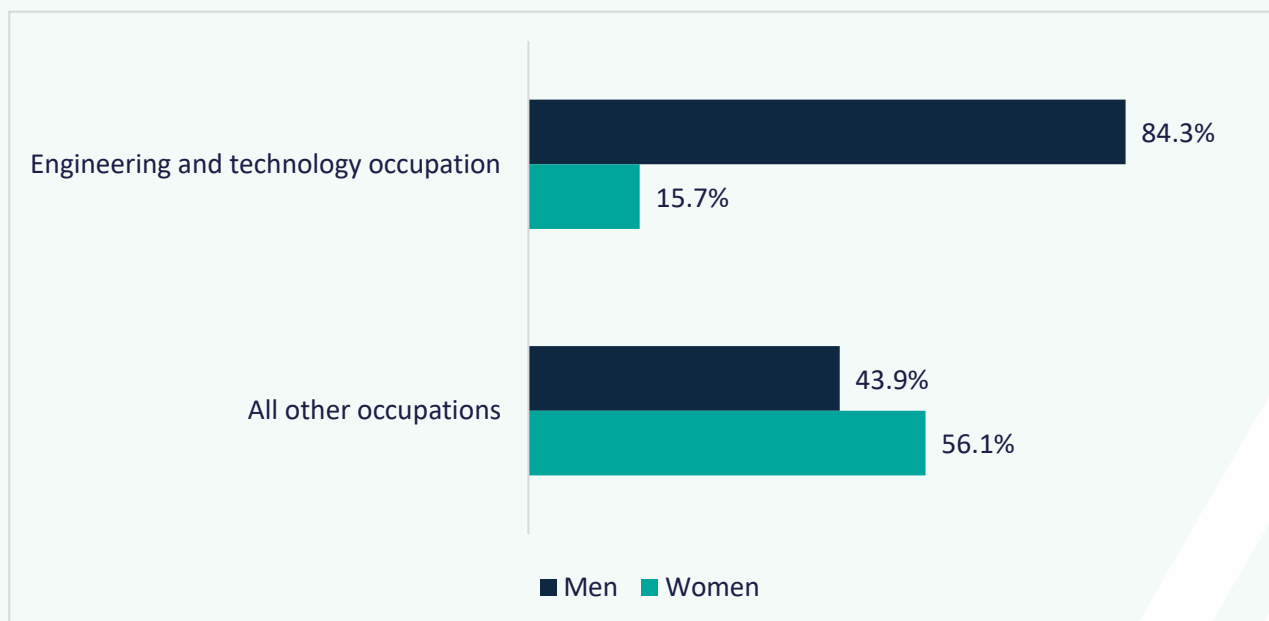
# Characteristics of those working in engineering and technology occupations

In this section we look at the demographic characteristics of those working in engineering and technology occupations (whether within the industry or in other sectors).

## Gender

Women remain significantly underrepresented in engineering and technology occupations. Worryingly, the percentage of women dropped from 16.5% in 2022 to 15.7% in 2023, representing a fall of approximately 38,000 women. This is despite the overall contribution of engineering and technology remaining consistent within the UK workforce at 19.2%. In stark comparison, women made up over half (56.1%) of all other occupations combined (figure 1).

**Figure 1: Percentage of men and women working in engineering and technology occupations compared to all other occupations.**

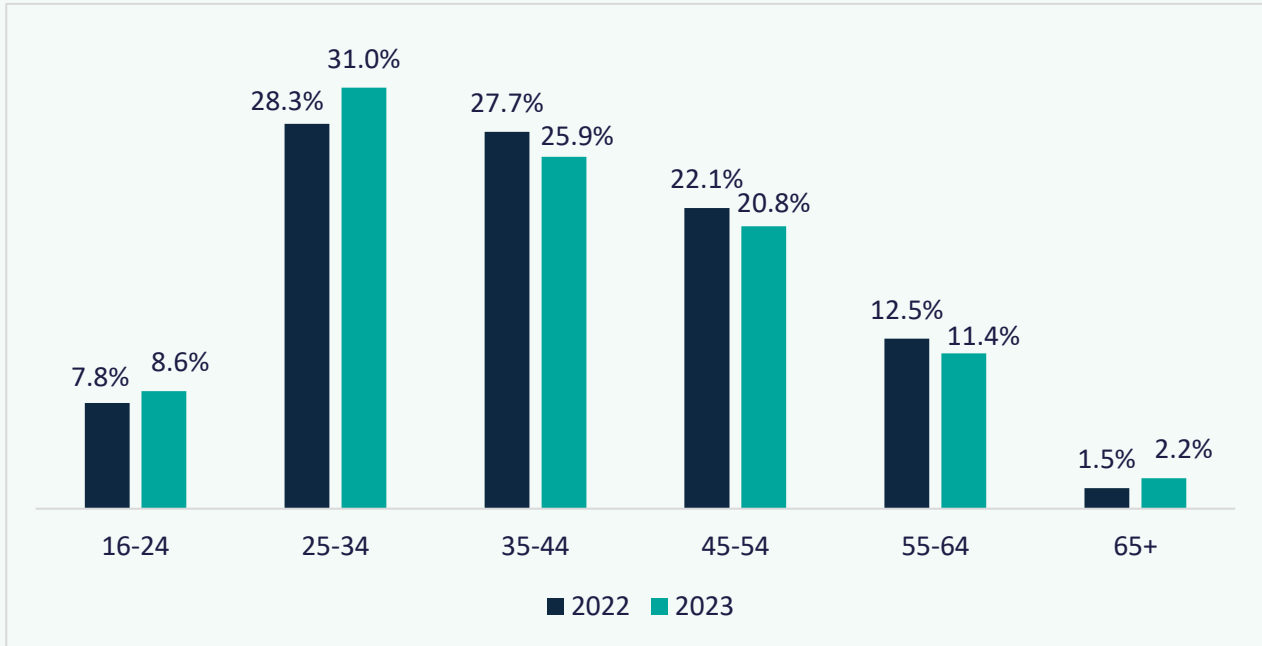


In our Women in Engineering 2024 Update<sup>5</sup>, published earlier this year, we explored where this decline was driven from to understand if this was an issue of recruitment, retention, or both. Results showed between 2022 and 2023, there were fewer women in engineering and technology occupations, specifically between the ages of 35 to 64 years. This drop spanned across 3 age categories, equivalent to approximately 66,000 women, with the highest drop occurring in those aged 35-44, representing roughly 29,000 women (figure 2).

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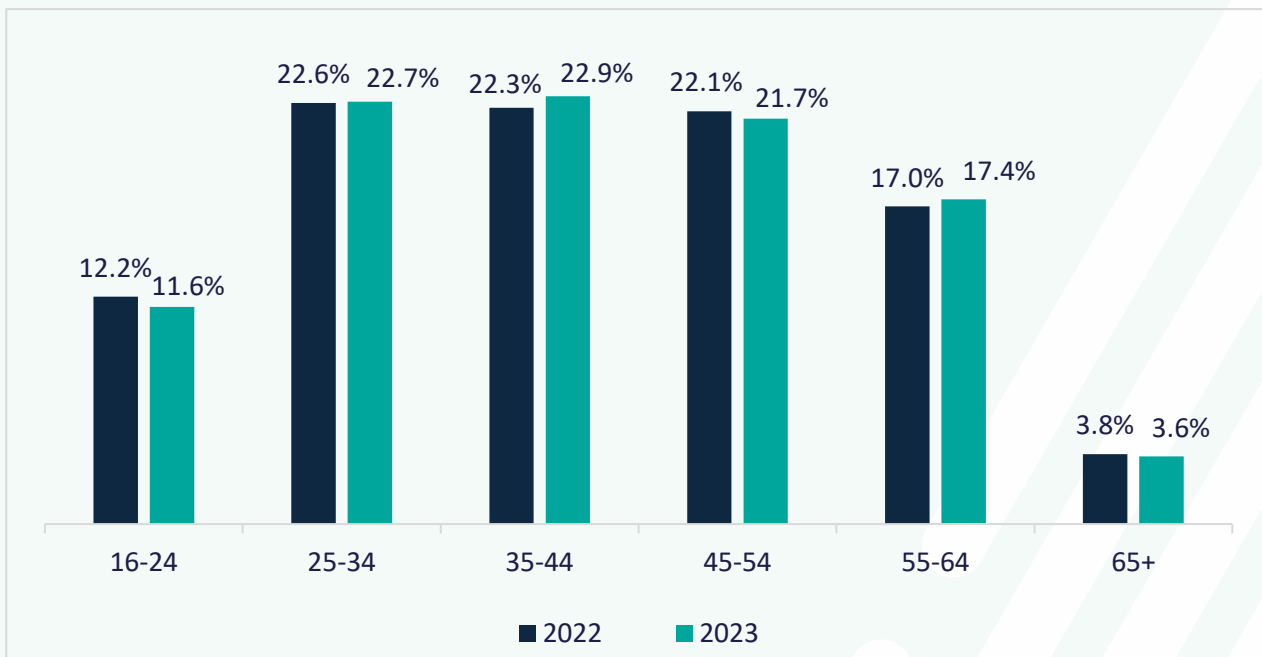
<sup>5</sup> EngineeringUK. (2024). *Women in engineering and technology*. Available at: <https://www.engineeringuk.com/media/bryloncz/women-in-engineering-2024-update-engineeringuk-may-2024.pdf>

**Figure 2: Women in engineering and technology occupations by age, comparing 2022 to 2023**



To understand if this drop (concentrated in the middle of the age range) was specific to engineering and technology or whether this effect was consistent across the workforce, we also looked at women working in all other occupations combined and found *no* observable drop between the ages of 35 and 64 years. Interestingly, we observed the reverse with the percentage of women aged 35-44 years in all other occupations *increasing* slightly from 22.3% in 2022 to 22.9% in 2023. Worryingly, these results suggest this drop in women aged 35-64 is specific to engineering and technology (figure 3).

**Figure 3: Women in all other occupations combined by age, comparing 2022 to 2023**

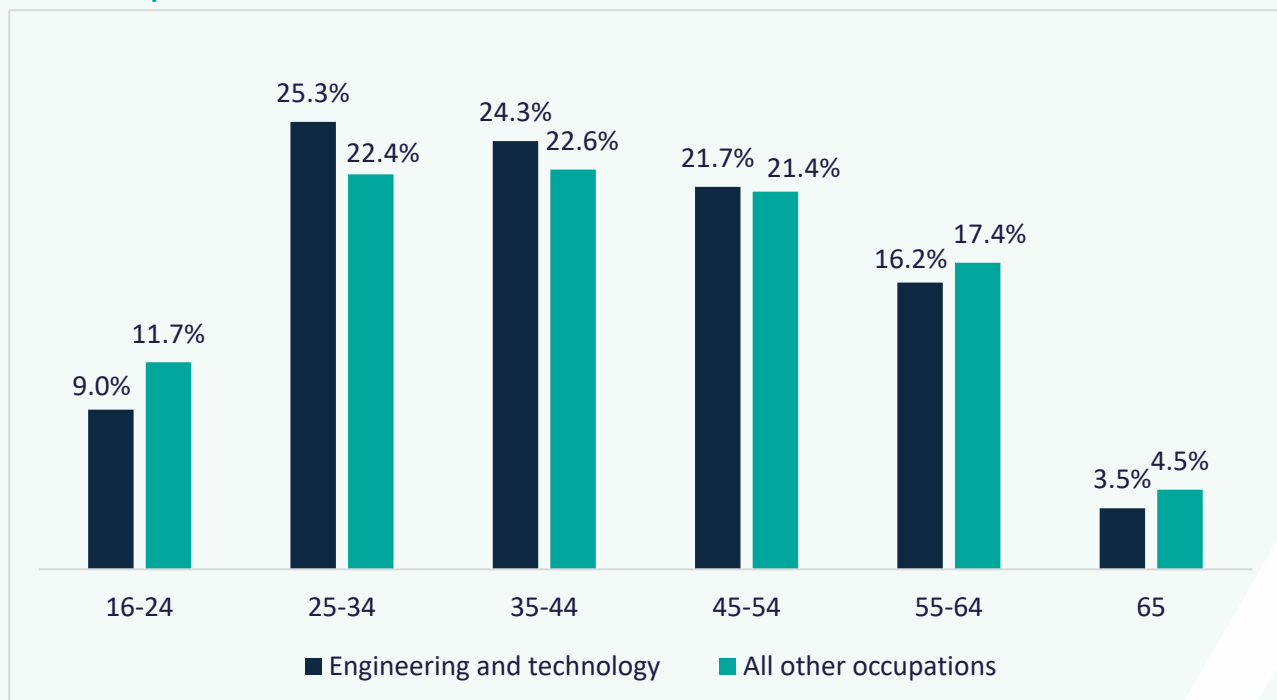


## Age

The largest proportion of people working in engineering and technology were between the ages of 25-34 years, at just over a quarter (25.3%). There was a higher proportion of people working in engineering and technology aged 25-44 compared to all other occupations combined (49.6% vs. 45.0% respectively).

Of those working in engineering and technology only 9.0% were between the ages of 16-24, compared to 11.7% for all other occupations combined. Equally, at the other end of the age ranges, the percentage of those working in all other occupations aged 55-64 and 65+ years was greater compared to engineering and technology (17.4% vs. 16.2%, and 4.5% vs 3.5% respectively).

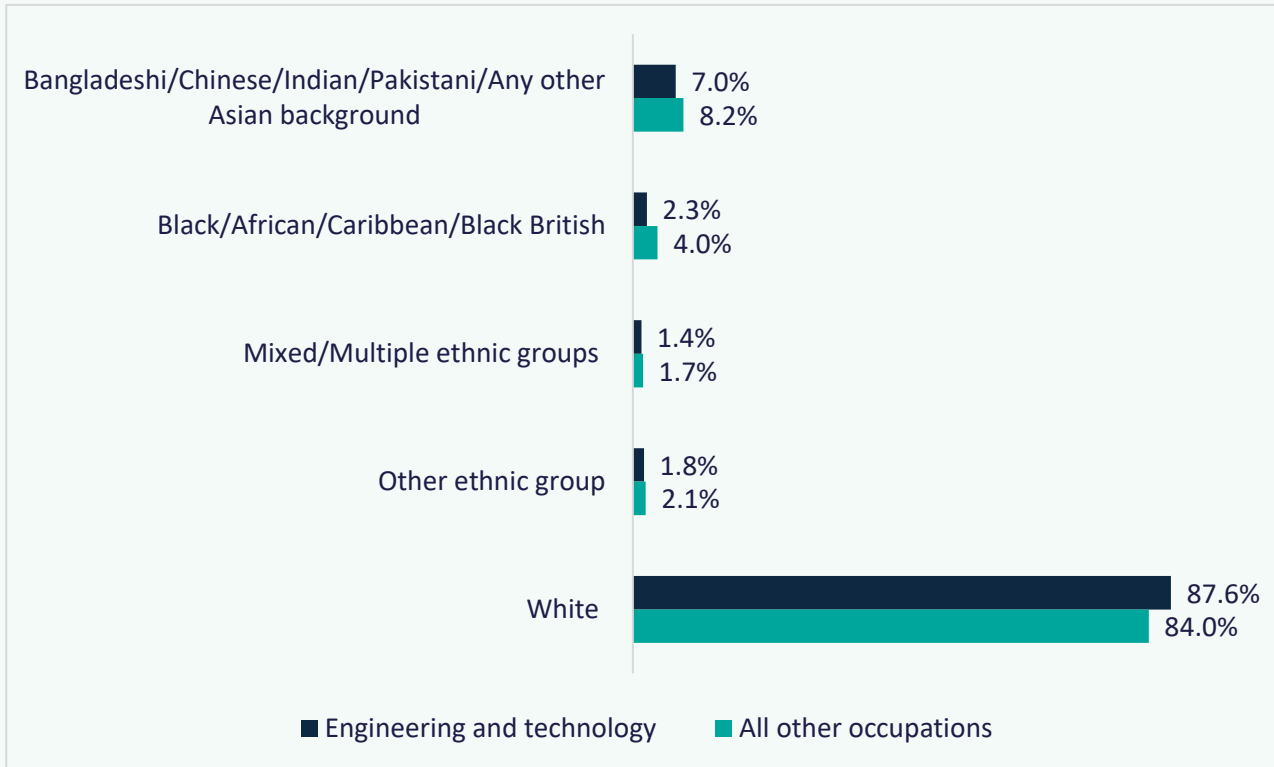
**Figure 3: Age of people working in engineering and technology occupations compared to all other occupations**



## Ethnicity

When looking at ethnic diversity, results for 2023 showed minority ethnic groups remain underrepresented in engineering and technology at 12.4%, compared to 16.0% amongst all other occupations (figure 4).

**Figure 4: Ethnicity of those working in engineering and technology occupations compared to all other occupations**



This picture, however, differs slightly when we look at each ethnic group in turn. For example, a similar proportion of people from ‘mixed/multiple ethnic groups’ were working in engineering and technology to all other occupations combined (1.4% and 1.7% respectively). There was also little difference between the two groups for ‘another ethnic group’ with 1.8% working in engineering and technology and 2.1% working in all other occupations combined.

There were fewer working in engineering and technology who are ‘Black / African / Caribbean / Black British’ (2.3%), compared to all other occupations (4.0%). Whilst results from 2023 also indicate fewer people from an ‘Bangladeshi / Chinese / Indian / Pakistani or any other Asian background’<sup>6</sup> were working in engineering and technology (7.0%) compared to all other occupations (8.2%), there were indications of differences between the ethnicities within this group, however, the sample sizes were too small to make these findings meaningful.

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<sup>6</sup> Ideally we would prefer to look at each of these ethnic groups individually, however, due to the small sample size the following groups were combined: Bangladeshi, Chinese, Indian, Pakistani and ‘any other Asian background’.

## Ethnicity and gender

It is also important to look at the intersectionality between gender and ethnicity. While minority ethnic groups were underrepresented in engineering and technology, there were important differences by gender. Most notably, there was a higher proportion of women from minority ethnic groups (18.3%) working in engineering and technology compared to men (11.4%).

This gender difference was most evident amongst people from a Bangladeshi / Chinese / Indian / Pakistani and any other Asian backgrounds. When looking at the ethnicities of women who were working in engineering and technology, 10.1% were Bangladeshi / Chinese / Indian / Pakistani and any other Asian backgrounds compared to 7.4% of women working in all other occupations. In contrast, only 6.4% of men working in engineering and technology were from a Bangladeshi / Chinese / Indian / Pakistani and any other Asian background compared to 9.3% for all other occupations. There was also a higher proportion of women working in engineering and technology from an 'other ethnic group' (2.9%) compared to men (1.6%) and women from all other occupations (1.9%) (table 9).

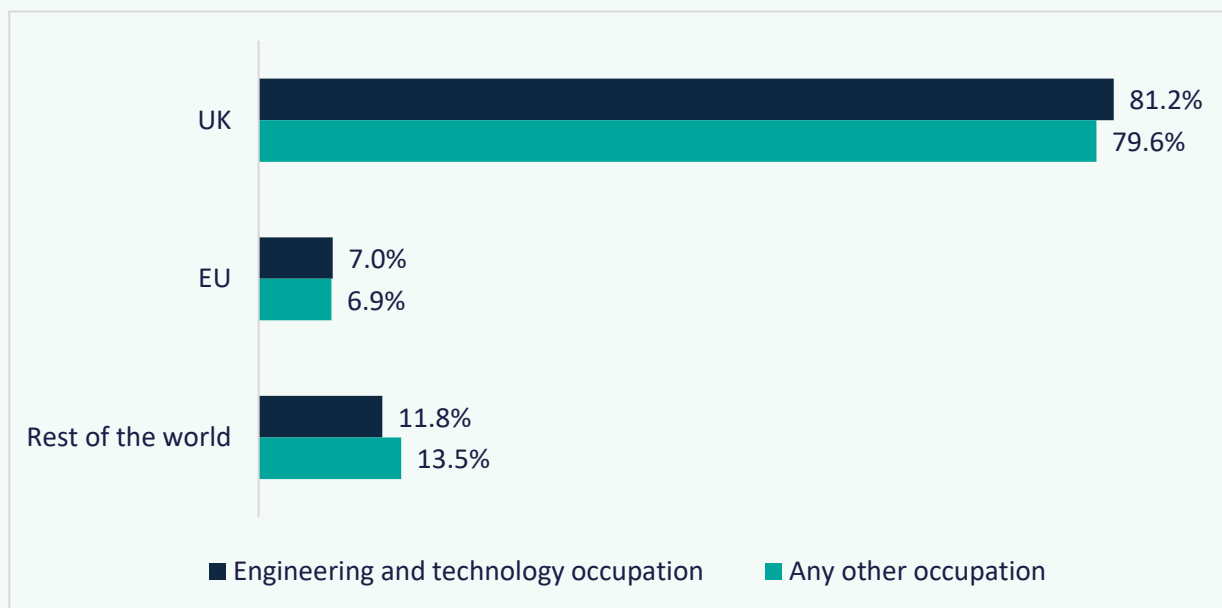
**Table 9: Ethnicity of those working in engineering and technology occupations by gender, compared to all other occupations**

Ethnicity	Men		Women	
	Engineering & technology	Any other occupations	Engineering & technology	Any other occupations
Bangladeshi/ Chinese/ Indian/ Pakistani/ any other Asian background	6.4%	9.3%	10.1%	7.4%
Black/ African/ Caribbean/ Black British	2.0%	3.9%	3.7%	4.1%
Mixed/ Multiple ethnic groups	1.3%	1.6%	1.6%	1.7%
Other ethnic group	1.6%	2.3%	2.9%	1.9%
White	88.6%	82.9%	81.7%	84.8%

## Country of birth

Over four-fifths of those in engineering and technology occupations were born in the UK (81.2%), slightly higher than any other occupation (79.6%). A further 7.0% were from the EU and the remaining 11.8% were from the rest of the world (RoW). Compared to engineering and technology (11.8%), there were more people working in any other occupation born outside the UK and the EU (13.5%) (figure 5).

**Figure 5: Country of birth for those working in engineering and technology occupations compared to all other occupations combined**



This contrasts with our 2024 Graduate Outcomes report<sup>7</sup>, where we found the usual place of residence for engineering and technology graduates was less likely to be the UK than for graduates in other subjects (74.1% vs. 83.9%). The percentage of engineering and technology graduates from the EU (8.4%) and the RoW (17.5%) was higher than the average across all other subjects (6.8% and 9.2% respectively).

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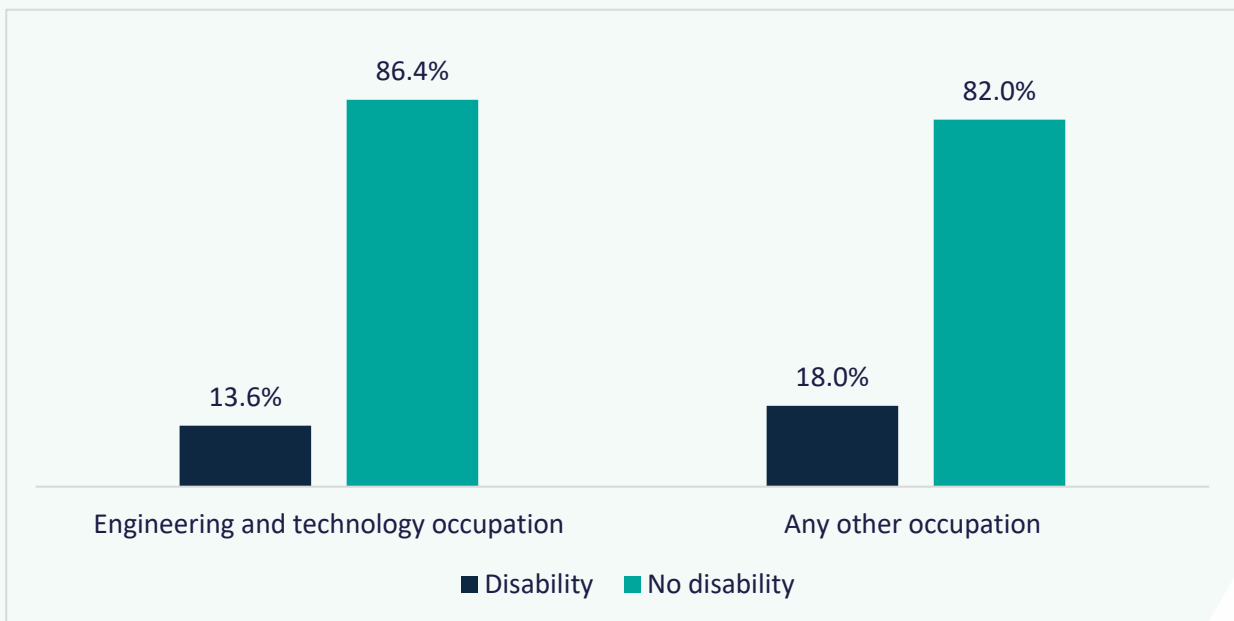
<sup>7</sup> EngineeringUK. (2024). *Graduate Outcomes – engineering and technology*. Available at: [www.engineeringuk.com/HE](http://www.engineeringuk.com/HE)

## Disability

Fewer people from engineering and technology occupations reported they had a disability, consistent with the Equality Act<sup>8</sup> (13.6%) compared to all other occupations combined (18.0%) (figure 6). Of those with disabilities, the main health problems reported included:

- Depression, bad nerves or anxiety – 16.2% compared to 17.5% of all other occupations
- Other health problems or disabilities – 16.1% compared to 18.5%
- Back or neck problems – 13.4% compared to 10.1%
- Legs or feet problems – 10.6% compared to 10.2%
- Chest or breathing problems, asthma, bronchitis – 7.1% compared to 6.4%

**Figure 6: Percentage with disabilities consistent with the Equality Act, comparing those in engineering and technology occupations to all other occupations combined**



<sup>8</sup> The Equality Act (2010) defines disability as a physical or mental impairment that has a substantial and long-term negative effect on a person's ability to do normal daily activities. To find out more see here: <https://www.gov.uk/definition-of-disability-under-equality-act-2010>

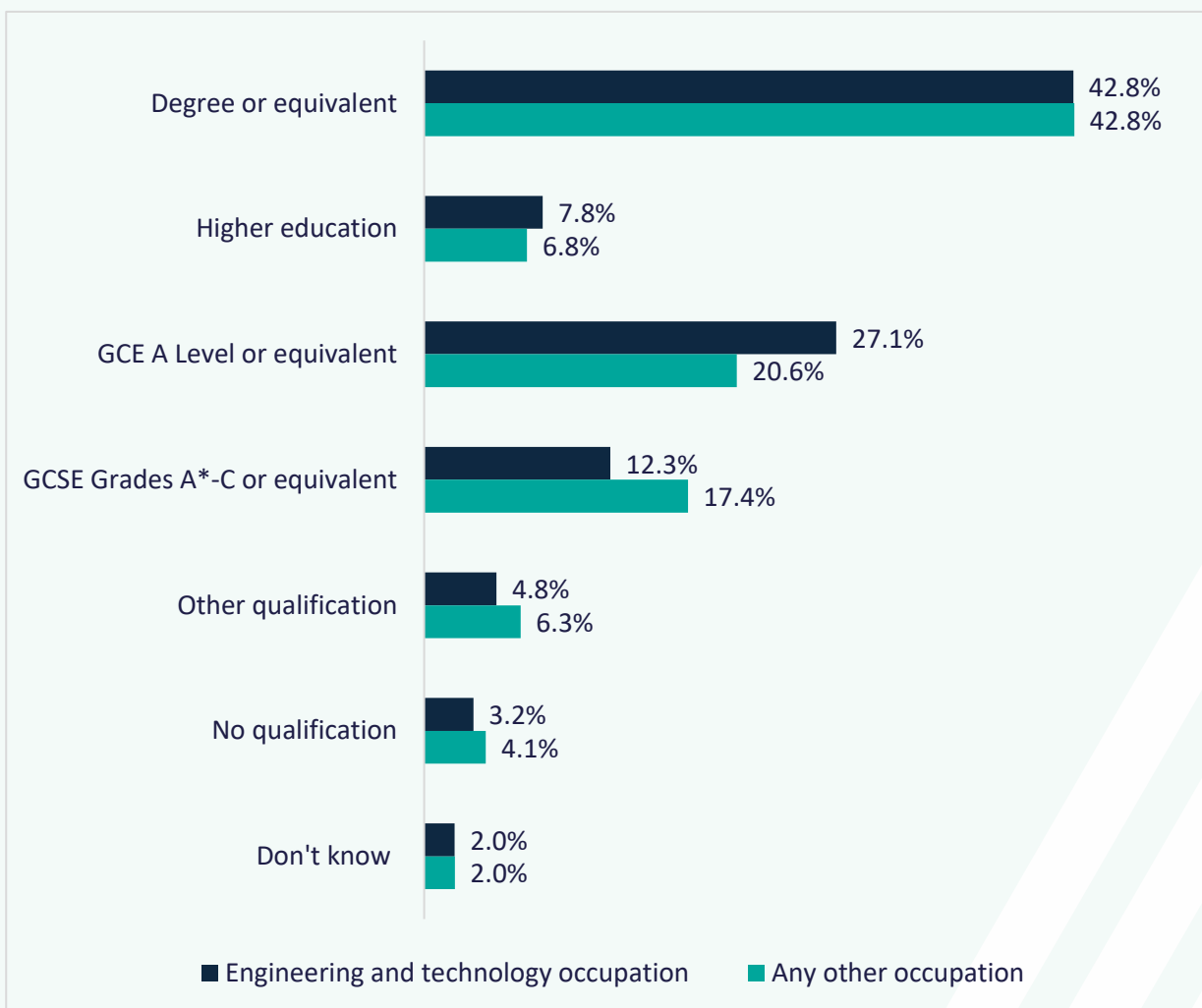


## Highest qualification

When looking at the type of highest qualification obtained, the same percentage of people working in engineering and technology and any other occupation (42.8%) said they had a degree or equivalent.

Beyond degree level, those working in engineering and technology tended to hold higher level qualification compared to all other occupations. For example, over a quarter of those working in engineering and technology held an A Level or equivalent qualification (27.1%) compared 20.6% of all other occupations, whereas a higher proportion from all other occupations said their highest qualification was a GCSE Grade A\*-C or equivalent (17.4%) compared to engineering and technology (12.3%) (figure 7).

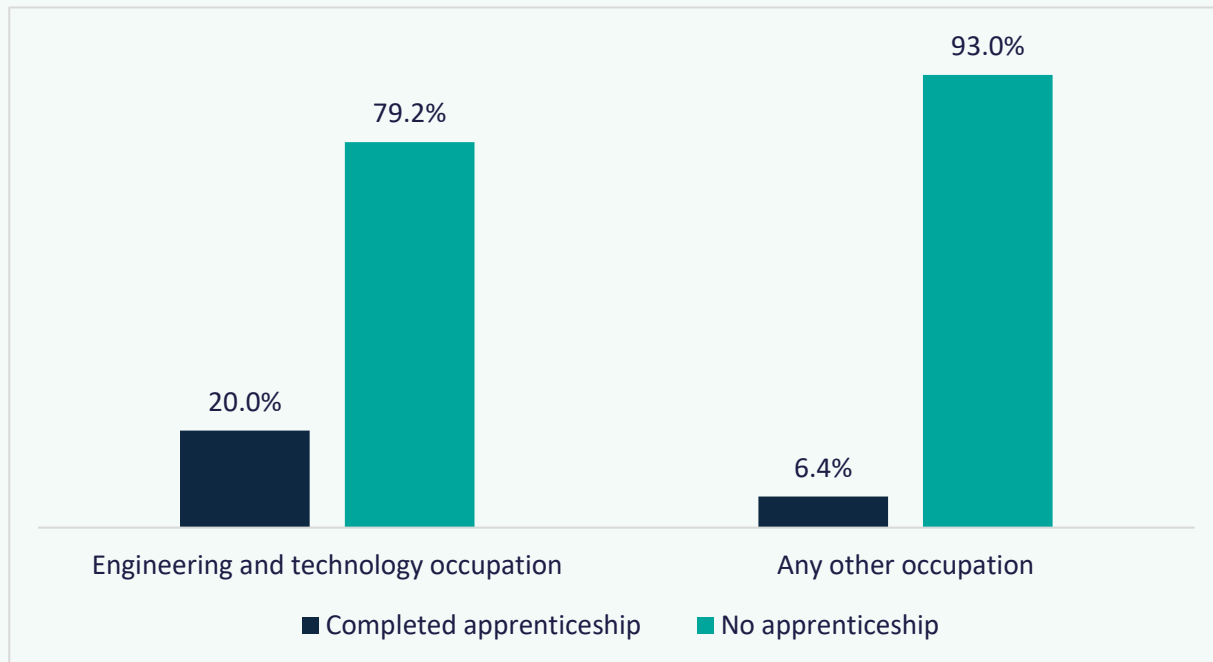
**Figure 7: Highest qualification held for engineering and technologies occupations compared to all other occupations as a percentage**



## Apprenticeships

Those in engineering and technology occupations were significantly more likely to have completed an apprenticeship compared to all other occupations combined. Whilst a fifth of people working in engineering and technology had done an apprenticeship (20.0%) only 6.4% of all other occupations said the same (figure 8). Additionally, of those working in engineering and technology, 3.4% were currently doing an apprenticeship compared to 1.3% for all other occupations.

**Figure 8: Percentage who had completed an apprenticeship, comparing engineering and technology occupations to all other occupations**



# Methodology

The data used in this report is from the ONS' quarterly LFS datasets for 2023. When conducting our analyses for the year 2023, we identified issues including more variability in response rates across the LFS' waves and a much lower response rate compared to previous years. As a result of the issues identified, for 2023 we have moved to looking at the quarterly data separately, and not combining across selected waves (1 and 5) and re-weighting to get an annual dataset. To find out more about our new methodology and its impact on the engineering footprint calculations, click [here](#).

Engineering and technology occupations were defined using our engineering footprint, an agreed upon list developed by ourselves, the Royal Academy of Engineering and the Engineering Council. In March 2024, we published a report prompted by the ONS revising its standard occupation classification (SOC) codes, which provided up-to-date figures for the percentage of people working in engineering occupations and can be accessed [here](#).

Whether an occupation belonged to the engineering and technology industry was determined by our pre-agreed upon list of SIC codes, which were also featured in our March 2024 report.

## Demographic data

### Gender

The data collected by the ONS records the sex of respondents, as opposed to the gender with which they identify. The decision was made to refer to gender throughout this report, rather than sex.

### Ethnicity

Ethnicity was measured using the LFS' 'Ethnicity (9 categories) UK level' variable, however, due to small numbers amongst those in engineering and technology occupations for the following ethnic groups: Bangladeshi, Chinese, Pakistani and 'any other Asian background' these were combined with Indian to form a new category.

### Age

For age we created a new variable using our age categories of interest from the LFS 'age' continuous variable.

### Disability

Disability was measured using the ONS' 'Disability equality act (GSS harmonised)' variable which looks at whether respondents have reported a disability consistent with the Equality Act. The Equality Act (2010) defines disability as a physical or mental impairment that has a 'substantial' and 'long-term' negative effect on a person's ability to do normal daily activities. 'Substantial' is defined as more than minor or trivial and 'long-term' means 12 months or more.

To further understand the *types* of health concerns we also looked at the ‘main health problems’ variable, which provides details of the type of concerns respondents experience.

### **Country of birth**

Country of birth was measured using the ‘country of birth main categories’ variable and to remain consistent with previous reports, where we only reported country of birth by UK, EU or RoW, the categories RoW and ‘other European countries’ were combined.

### **Highest qualification**

Highest qualification was measured using the ‘highest qualification or trade apprenticeship’ variable, which reports the type of highest qualification held in the UK.

## Who are we

Established in 2001, EngineeringUK is a not-for profit organisation, funded predominantly via the professional registration fees of individual engineers, as well as the support of a range of businesses, trusts and foundations, and a corporate membership scheme. Our ambition is to enable more young people from all backgrounds to be informed, inspired and progress into engineering and technology.

Working in partnership to inspire more young people from a greater range of backgrounds to pursue the exciting career opportunities in modern engineering and technology is at the heart of EngineeringUK's purpose. Collaboration is essential to reach our long-term vision: for the UK to have the diverse workforce needed for engineering and technology to thrive and to drive economic prosperity, improve sustainability and achieve net zero

## Driven by data

Our work is rooted in our understanding of the current and future needs of the engineering and technology workforce. We complement that understanding by establishing which activities help increase the number and diversity of young people choosing engineering, technology and technician careers, especially those in sustainability and net zero.

We base everything we do on evidence, and we share our analysis and insight widely. We publish comprehensive data on all aspects of engineering and technology in the UK – providing a detailed examination of the economic contribution, the workforce composition, as well as the extent to which workforce supply through education and training is likely to meet future demand for engineering and technology skills.

We evaluate all our activity to help ensure our engagements with young people are as effective as possible. It is through evaluation that we can identify the extent to which our programmes are winning the hearts and minds of young people, increasing their understanding of engineering and technology, and changing their perceptions of a career in it as something they'd consider for themselves, regardless of background and gender.