

Introduction

The following information is designed to provide GENERAL GUIDELINES on physical preparation for applicants intending to undertake the National Firefighter Selection Tests (NFSTs). It is important to note that good exercise training advice should be highly specific to you as an individual, and will depend upon your general health, age, current fitness level, previous training history, lifestyle and ultimate fitness goals. The guidelines presented here should be used to give you the information required to build yourself a specific individual fitness-training programme.

Ideally, you should seek advice from a qualified fitness professional who will help you design, undertake and evaluate a physical training programme that is specific to your needs in preparing to undertake the National Firefighter Selection Tests (NFSTs). Involving a qualified fitness professional will also help develop correct training techniques, as well as increasing your motivation and long-term adherence to the training regimen. However, it is important that you have a general understanding of the basic principles of training, and the specific physical requirements that underpin the NFSTs in order to make the most of the training that you perform. These guidelines will provide you with this knowledge and guide you through a typical 12-week training programme that is designed for a physically active individual with some previous physical training, exercise or sports experience (e.g. hockey, circuit training, cycling etc.). This programme will not only maximize your chance of success on the physical NFSTs, but may also reduce your risk of injury during the tests and, if selected, during your subsequent firefighter training.

It is also important to realise that the role of a firefighter can be physically demanding, and consequently, firefighters are required to maintain good general levels of physical fitness throughout their careers. You should not view your physical

preparation for the NFSTs as a goal to an end, but as part of the everyday job requirement for serving firefighters. By undertaking a period of physical training before selection, you will be able to determine if you are suited to a job that requires a good level of overall fitness to be maintained during your career.

Important Safety Information

If you are in any doubt about your health or physical ability to exercise, you should consult your Doctor before commencing any physical training programme. This is especially important if you are (or think you might be) pregnant, if your health status has recently changed, or have not exercised for the last six-months or have had a recent illness or injury.

Remember there are no quick ways to develop good general fitness levels. You must progress slowly and gradually by following a structured training programme to reach your goal. Many people train too hard or too frequently to start with, become injured and end up not being able to train effectively at all. It is better to do too little than too much during the early stages of any fitness programme!

You must wear appropriate clothing during your training. This is especially important with regards to footwear. A good training shoe designed to match your physical characteristics is essential to minimize your chance of injury. A podiatrist will be able to advise you on which type of shoe will meet your training needs.

Always begin your training sessions with a thorough warm-up and cool-down afterwards. The warm-up and cool-down will be discussed in more detail later on.

Do not train if you are unwell or injured. It is better to rest than train through an illness or injury. Think

long term and not just to the next one or two training sessions.

What is Physical Fitness?

Physical fitness is often described as the overall physical condition of the body, which can range from peak condition for performance at one end of the spectrum to extreme illness or injury at the other.

Aerobic Endurance allows you to continue to exercise for prolonged periods of time (> 3 minutes) at low to moderate/high intensity (e.g. running out a number of 70 mm hoses to provide a water supply for a fire).

Muscular Strength allows you to lift, lower, pull, push and carry heavy objects over very short distances/periods of time (e.g. lifting a 13.5 m ladder back on to an appliance).

Muscular Endurance is closely linked to both aerobic endurance and muscular strength, but allows you to continue to lift, lower, pull, push and carry heavy objects for more prolonged periods of time (e.g. carrying a light portable pump (~ 33 kg) from an appliance across a field to an external water source).

Flexibility refers to your ability to move your limbs and joints into specific positions at the end of their normal range of movement. Flexibility is important, as it will allow your body to work in cramped positions without unduly stressing the muscles, tendons and ligaments (e.g. crawling through small spaces whilst searching the floor space for a casualty in a house fire).

How to Develop and Maintain Physical Fitness

Improving physical fitness requires some self-discipline and efficient use of time, as an effective

exercise routine needs to be completed on a regular basis (at least 3 days per week). Any physical training programme has four key components that can be manipulated to produce the desired training effect. These are the **mode** of exercise (the type of exercise) e.g. cycling, running, swimming, etc., the training **intensity** (how hard you are exercising), the training **duration** (how long you are exercising) and the training **frequency** (how often you are exercising). By specifically modifying these four components of training, you will be able to develop and maintain aerobic endurance, muscular strength, muscular endurance and flexibility. Table 1 outlines the key elements required to develop these specific components of fitness.

	Mode	Duration	Frequency	Intensity
Aerobic / Long term Endurance	E.g. 4 mile run, aerobics class/gym session, 5-a-side football	20-60 min (can be accumulated using >10 min blocks of activity throughout the day)	3-5 days per week	Weeks 1-6: RPE 12-16 or 60-85 % HRmax Weeks 7-12: RPE 14-18 or 70-90 % HRmax Lower intensity aerobic exercise is usually associated with longer duration activity.
Muscular / Short Term Endurance	Circuit Training, moderate weight training. e.g. press-ups, sit-ups.	One to three sets (10-50 reps) of 8-12 different exercises	1-3 days per week	Weeks 1-6: 20-50 RM Weeks 7-12: 12-20 RM
Strength	Heavier Weight Training e.g. bench press, squat	One to two sets (each set has 6-15 reps) of 8-12 different exercises	2-3 days per week	Weeks 1-4: 12-15 RM Weeks 5-8: 6-12 RM Weeks 9-12: 4-8 RM
Flexibility	Stretching	10-30 s for each exercise, repeated 1-3 times per muscle group or joint	2-3 days per week (daily if possible)	Move to the point of discomfort but not pain and hold, moving slightly further as the muscle relaxes.

Table 1 was adapted from the American College of Sports Medicine

Preparing for Exercise (Warm-Up) and Cooling Down Afterwards

Warm-Up: You should always perform a warm-up before undertaking any training session and finish the session with a cool-down. Performing a warm-up prepares the body for the activity about to be undertaken. The length of time needed to warm up sufficiently depends on many factors; however, you should allow at least 5-10 minutes for this important activity.

To reduce the risk of injury in the warm-up period, a number of steps should be followed:

Be Specific: Make sure your warm-up session is focused towards the activity that you intend to perform. For example, for cardiovascular workouts, such as running, start with a brisk walk leading into a light jog. For weight training, it is important to warm up the particular joints and muscles that are involved in the resistance exercise. This will increase blood flow to those muscles and activate the nervous system, prior to any additional stress being placed on them.

Start Slowly: at the start of your workout, your muscles will be relatively cold. Start exercising slowly and build up the intensity throughout the warm-up period. This will increase your muscle temperature steadily and keep the risk of injury to a minimum.

Keep Warm: If you are exercising in a cold environment, wear additional clothing during the warm-up period and try not to stand still for too long.

Stretching: For many years, it was thought that stretching as part of the warm-up would prevent injuries. However, there is no scientific evidence to support these claims. Stretching to develop or maintain flexibility should be performed at the end of a training session.

Cool-Down: The cool-down should follow the opposite principles to the warm-up, gradually reducing the exercise intensity over the final 5-10 min of the session to bring your body slowly

back to a near resting state. As the body is already warm from the exercise session when the cool-down begins, this is an ideal time to incorporate some of the exercises designed to develop flexibility, where the stretches should be held for 10-30 s (see Table 1).

Circuit Training:

The circuit is designed to develop muscular endurance and uses minimal equipment. You will need a gym mat and a stepping platform of about 30 cm in height. Choose 5-10 of the exercises listed below according to your fitness level. Five exercises are plenty if you are just starting your training regime. You can add further exercises as you become stronger. It is wise to consider the muscles that each exercise works so that you place them in an order which avoids targeting the same muscle groups straight after one another e.g. press ups and seated triceps dips both target the muscles at the rear of the upper arm (triceps); squats and lunges both work the muscles at the front of the upper thigh (quadriceps).

You can use the guidelines presented in Table 2 for muscular endurance to build a simple circuit. For example, you could perform 30 seconds of each of the exercises listed below (where you should aim to perform 12-50 RM), with 30-60 seconds rest between each exercise. You could make the circuit session more aerobically demanding by performing box stepping during the 30-60 seconds recovery period. As you progress, repeat the circuit a further 1-2 times. You can adjust the number of exercises (5-10), the difficulty of the exercises, the exercise time (20-60 seconds), the recovery duration (20-60 seconds) and the recovery activity to suit your fitness level.

Table 2. Example of a simple circuit that can be carried out without specialist equipment.

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Exercises	Alternative
Press up	Knees Press up (easiest), Box press up (easier); Declined press up (Hard)
Squat thrust	Alternate squat thrusts (less stress on the back)
Abdominal crunch	
Squat	
Lunge	
Burpee	
Back Extension	Hands under forehead (harder), hands behind head (hardest)
Seated triceps dip	
Tuck jump	
Stride jump	
Recovery	
Rest	Marching on the spot, Step ups, Rope Skipping

Circuit Exercises

Press up



- Keep back straight
- Don't allow body to sag in the middle

Alternative press up exercises



Squat Thrust



- Keep back straight

Abdominal Crunch



- Don't pull on neck
- Just lift shoulders off floor

Squat



- Keep back straight

Lunge



- Keep back straight, face forward
- Drop back knee
- Don't allow supporting knee to go too far beyond supporting ankle

Burpee



- As press up and squat thrust



Back Extension



- Keep legs on floor
- Don't hyper-extend neck or back

Seated Triceps Dips



Tuck Jump



- Use soft surface

Stride Jump



- Keep back straight and head forward
- Land with slight bend in knees

Step Up



- Keep knees at 90 degrees with hip

Weight Training Exercises

With all weight training exercises, breathe freely when lifting and lowering the weight. Do not hold your breath!

Chest Press



- Ensure lower back neutral and not excessively arched
- Keep feet firmly on the floor
- Push weights above chest keeping slight bend in the elbow

Seated Row



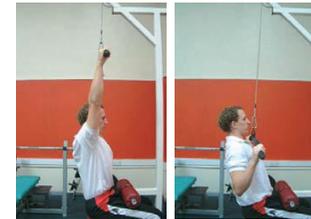
- Keep back straight with slight bend in the knees

Shoulder Press



- Keep back neutral and not excessively arched
- Raise weights above head keeping slight bend in the elbows
- Keep feet firmly on the ground

Lateral Pull Down



- Keep feet firmly on the ground
- Keep back straight
- Pull bar straight down to the front of your head drawing elbows in to side of body

Squat



- Keep back straight and head facing forwards
- Flex at hips keeping knees directly over the ankles
- Push up through heels to return to standing

Lunge



- Drop back knee to the floor and ensure supporting knee is directly over the ankle
- Keep back straight and face forward

Developing and Maintaining Flexibility

Flexibility exercises should be incorporated into your overall fitness program, sufficient to develop and/or maintain your range of motion. Flexibility training may reduce your likelihood of injury, reduce muscle soreness following exercise and may enhance muscular performance. To develop your flexibility, you should follow the guidelines in Table 1, holding each stretch for 10-30 seconds and repeat each stretch 1-3 times. As the body tends to be fairly static during your flexibility training, it begins to cool down. Therefore, flexibility training is ideally suited to follow on from an aerobic endurance or muscular strength or endurance training session, and can form an integral part of the cool-down period.



Triceps

- Stand upright with arm bent, raised overhead.
- Grasp elbow with opposite hand
- Pull your elbow gently behind your head
- You should feel the stretch in the back of your arm



Rear shoulder, upper back

- Sit or stand with one arm straight

- With other arm grasp above elbow of straight arm
- You should feel the stretch in the back of shoulder and upper back



Quadriceps stretch

- Stand upright using one hand to support your body.
- Raise heel to buttocks and grasp the ankle with hand
- Slight bend in the knee of supporting leg
- Stand upright and keep bent knee close to the supporting knee
- You should feel the stretch in the front of the thigh



Calf stretch

- Stand upright slightly more than arm's length from the wall
- Bring one leg forward with slight bend in knee and keep opposite leg straight behind, keeping heels on the floor and feet pointing forward
- Lean forward to feel the stretch in the calf of the back leg



Hamstring stretch

- Sit upright on the floor with both legs straight
- Bend one knee and slide the heel until it touches the inner side of the opposite thigh
- Lower the outer side of the thigh and calf of the bent leg onto the floor
- Bend forward at the hip and lower your torso towards the extended thigh, keeping back straight
- You should feel the stretch in the back of the thigh



Groin stretch

- Sit on floor with back straight and bent legs
- Grasp your ankles and move them as close to your body as possible
- Rest your elbows on your knees pushing them down towards the floor
- You should feel the stretch in the inner thigh



Buttock stretch

- Lie flat on your back with one leg crossed over the knee of the other leg
- Move the knee towards you keeping your back and shoulders on the floor
- You should feel the stretch in the buttocks

A General 12-week Physical Fitness Programme:

The following programme is 12 weeks long and is an example of how you could go about training to pass the selection tests. It eventually builds up to 3 running sessions, 2 resistance training sessions to improve your strength and muscular endurance and 2 flexibility sessions per week (although you can always add some additional flexibility exercises to the end of any training session if you have time). The programme starts relatively easy and gets progressively harder. You should alternate between your running and muscular strength and endurance sessions so that you do not perform the same training on consecutive days e.g.

Mon - Steady run

Tue - Resistance training (strength & endurance) – Flexibility

Wed – Fartlek

Thu - Resistance training (strength & endurance) – flexibility or REST

Fri - Steady run

Sat – REST

Sun - Muscular strength weights - flexibility

If you miss an exercise session, do not attempt to do 2 sessions in 1 day to make up. If you are unwell or injured then do not train until you have fully recovered. Make sure you have read and understood the programme before you start training. Note, this programme is shown to give you an understanding of what a training programme might look like, based on the principles described in this document. It is not intended that you follow it to the letter, but use it for guidance to develop your own programme that meets your specific training needs.

WARNING:

A significant reduction in aerobic fitness occurs after only 2 weeks of not training. However, if you begin to feel tired and worn out, do not be afraid to take a few days off and rest. You could even build in recovery weeks after weeks 4 and 8 where you may only do 1-2 steady pace runs of 20-30 minutes to maintain your fitness before pushing on with the programme. Remember this is a general programme and must be modified by yourself or your fitness instructor to suit your needs and match your rate of fitness progression.

KEY POINTS

1. You must listen to your body and modify the programme to suit your individual needs and rate of fitness progression. REST is important too so do not be afraid to miss a couple of sessions or build in a recovery week if all the training is becoming too much to cope with.

2. The exercise durations shown in the 12-week training programme do not include the time required for warm-up and cool-down. These should always be included with all training sessions.

Your 12 Week Guide to Achieve Firefighter Fitness Standards

Days	Training Schedule: WEEK 1	Training Schedule: WEEK 2	Training Schedule: WEEK 3	Training Schedule: WEEK 4	Training Schedule: WEEK 5	Training Schedule: WEEK 6
1	RUN – steady pace 20 minute at 60-85% HR max Achieved	RUN – steady pace 20 minute at 60-85% HR max Achieved	RUN – steady pace 20 minute at 60-85% HR max Achieved	RUN – steady pace 20 minute at 60-85% HR max Achieved	RUN – steady pace 20 - 25 minutes at 60- 85% HR max Achieved	RUN – steady pace 20 - 25 minutes at 60-85% HR max Achieved
2	UPPER BODY – resistance Training at 1 set 15-20 RM Achieved	UPPER BODY – resistance Training at 1 set 15-20 RM Achieved	UPPER BODY – resistance Training at 1 set 12-15 RM Achieved	UPPER BODY – resistance Training at 1 set 12-15 RM Achieved	UPPER BODY – resistance Training at 1 set 6-12 RM Achieved	UPPER BODY – resistance Training at 2 sets 6-12 RM Achieved
3	FLEXIBILITY – Stretch to point of discomfort	FLEXIBILITY – Stretch to point of discomfort				
4	RUN – steady pace 20 minute at 60-85% HR max Achieved	RUN – steady pace 20 minute at 60-85% HR max Achieved	RUN – steady pace 20 minute at 60-85% HR max Achieved	RUN – steady pace 20 minute at 60-85% HR max Achieved	RUN – steady pace 20 - 25 minutes at 60- 85% HR max Achieved	RUN – steady pace 20 - 25 minutes at 60-85% HR max Achieved
5	UPPER BODY – resistance Training at 1 set 15-20 RM Achieved	UPPER BODY – resistance Training at 1 set 15-20 RM Achieved	UPPER BODY – resistance Training at 1 set 12-15 RM Achieved	UPPER BODY – resistance Training at 1 set 12-15 RM Achieved	UPPER BODY – resistance Training at 1 set 6-12 RM Achieved	UPPER BODY – resistance Training at 2 sets 6-12 RM Achieved
6	FLEXIBILITY – Stretch to point of discomfort	FARTLEK – 20 minutes 75 – 85% HR max Achieved	FARTLEK – 20 minutes 75 – 85% HR max Achieved			
7	Rest Day	Rest Day	Rest Day	Rest Day	FLEXIBILITY – Stretch to point of discomfort	FLEXIBILITY – Stretch to point of discomfort

Days	Training Schedule: WEEK 7	Training Schedule: WEEK 8	Training Schedule: WEEK 9	Training Schedule: WEEK 10	Training Schedule: WEEK 11	Training Schedule: WEEK 12
1	RUN – steady pace 25 minutes at 70-90% HR max Achieved	RUN – steady pace 25 minutes at 70-90% HR max Achieved	RUN – steady pace 25 minutes at 70-90% HR max Achieved	RUN – steady pace 25 minutes at 70-90% HR max Achieved	RUN – steady pace 25 - 30 minutes at 70-90% HR max Achieved	RUN – steady pace 25 - 30 minutes at 70-90% HR max Achieved
2	UPPER BODY – resistance Training at 2 sets 6-12 RM Achieved	UPPER BODY – resistance Training at 2 sets 6-12 RM Achieved	UPPER BODY – resistance Training at 2 sets 12-15 RM Achieved	UPPER BODY – resistance Training at 2 sets 6-12 RM Achieved	UPPER BODY – resistance Training at 2 sets 12-15 RM Achieved	UPPER BODY – resistance Training at 2 sets 6-12 RM Achieved
3	FLEXIBILITY – Stretch to point of discomfort	FLEXIBILITY – Stretch to point of discomfort	FLEXIBILITY – Stretch to point of discomfort	FLEXIBILITY – Stretch to point of discomfort	FLEXIBILITY – Stretch to point of discomfort	FLEXIBILITY – Stretch to point of discomfort
4	RUN – steady pace 25 minutes at 70-95% HR max Achieved	RUN – steady pace 25 minutes at 70-90% HR max Achieved	RUN – steady pace 25 minutes at 70-90% HR max Achieved	RUN – steady pace 25 minutes at 70-90% HR max Achieved	RUN – steady pace 25 - 30 minutes at 70-90% HR max Achieved	RUN – steady pace 25 - 30 minutes at 70-90% HR max Achieved
5	UPPER BODY – resistance Training at 2 sets 6-12 RM Achieved	UPPER BODY – resistance Training at 2 sets 6-12 RM Achieved	UPPER BODY – resistance Training at 2 sets 12-15 RM Achieved	UPPER BODY – resistance Training at 2 sets 6-12 RM Achieved	UPPER BODY – resistance Training at 2 sets 12-15 RM Achieved	UPPER BODY – resistance Training at 2 sets 6-12 RM Achieved
6	FARTLEK – 25 minutes 70 – 90% HR max Achieved	FARTLEK – 25 minutes 70 – 90% HR max Achieved	FARTLEK – 25 minutes 70 – 90% HR max Achieved	FARTLEK – 25 - 30 minutes 70 – 90% HR max Achieved	FARTLEK – 25 - 30 minutes 70 – 90% HR max Achieved	FARTLEK – 25 - 30 minutes 70 – 90% HR max Achieved
7	FLEXIBILITY – Stretch to point of discomfort	FLEXIBILITY – Stretch to point of discomfort	FLEXIBILITY – Stretch to point of discomfort	FLEXIBILITY – Stretch to point of discomfort	FLEXIBILITY – Stretch to point of discomfort	FLEXIBILITY – Stretch to point of discomfort

Key: RM= Repetition Maximum – The number of repetitions to lift per set. HR max= Heart Rate Maximum - This determines the intensity of the workout. It is the percentage of your maximum heart rate. Fartlek= Swedish term for speed play – A Fartlek session should involve a combination of fast and slow running during the run.

The 12-week programme above is a suggested programme and can be altered or changed to accommodate different needs and time availability.

PHYSICAL ASSESSMENT

This is designed to assess your level of physical fitness and ability to become a firefighter.

The physical assessment will consist of:

Ladder Climb

To complete the test successfully you will need to show confidence and apply the correct technique to climb the ladder.

- You will be shown how to climb the ladder and how to apply the leg lock. You will then be allowed to practice the leg-lock.
- You will climb the ladder until you are approximately 9 metres from ground level.
- At that point, you will use a leg-lock to secure yourself to the ladder then remove your hands from the ladder and lean back, looking over your shoulder to identify an object, which is being held by an instructor at ground level.
- When you have identified the object, you will be told to put your hands back on the ladder and release the leg-lock.
- You will then be instructed to descend the ladder.

Casualty Evacuation Test (41 Seconds)

To complete the test successfully you will need to combine upper and lower body strength and co-ordination. You will be required to drag a mannequin/dummy for a distance of 30 metres.

Ladder Lift Simulator Test

To complete the test successfully you will need to combine upper and lower body strength and co-ordination to lift the ladder to the required height (190cm) and lower it safely under control. The weight added to the lifting bar is 15kg.

Enclosed Space Test (5 Minutes)

To complete the test successfully you will need to combine confidence, agility and strength to negotiate the crawl way.

You will be required to negotiate a crawl way.

- You will start the test wearing a BA facemask with clear vision.
- Make your way through the crawl way until you reach the assessor at the opposite end of the unit, there is only one way through the run; forward, left, right or up, down and there are no doors to open.
- When you reach the other end, an assessor will stop you, place an obscuration cover over your facemask, turn you around and tell you to return along the route you have just taken.
- You should complete the test without jeopardising your safety and wellbeing.
- Your time will start as soon as you enter the crawl way and will stop when you exit.
- The assessor tapping you on the shoulder and saying STOP will indicate the finish.
- You may withdraw yourself from the test at any time, or if the safety officers think you are suffering unduly you will be withdrawn from the test.

Equipment Carry Test (5 Minutes 47 Seconds)

To complete the test successfully you will need to combine endurance, upper and lower body strength and co-ordination.

You will be carrying equipment over the length of the course, moving around the two cones, which cover a distance of 25 metres.

- The items are laid out on the start/finish line in the order that they are to be used.
- You will start level with this line holding the hose-reel at waist height.
- Run the hose to the second cone and place it down.
- Run/jog back to the start and pick up the two coils of red hose by the handles.
- Carry them up and down the course of four lengths, then place one down back in the marked space.
- Pick up the other by the centre lugs and carry at chest height down to the second cone and place it down, then jog three lengths back to the start.
- Pick up, carry the straight silver hose and basket up and down the course for four lengths, and place back in the marked space.
- Then run/jog up and down the course four lengths.
- Then pick up and carry the barbell up and down the course 4 lengths.

Firefighter Fitness Standards

It is important to realize that the role of a firefighter can be physically demanding, and consequently firefighters are required to maintain good general levels of physical fitness throughout their careers. As such, physical training is an important part of a firefighter's ongoing development. In order to maintain the training effect, exercise must be continued on a regular basis.

In addition, it is widely accepted that individuals can substantially improve their health and quality of life by including moderate amounts of physical activity in their daily lives. Health benefits from physical activity are thus achievable for most people, including those who may dislike vigorous exercise and those who may have been previously discouraged by the difficulties of adhering to a program of vigorous exercise. For those who are already achieving regular moderate amounts of activity, additional benefits can be gained by further increases in activity levels.

Physical activity has been shown to improve both physical and mental health and it is one of the most important factors in maintaining a good quality of life.

The risk posed by physical inactivity is almost as high as several well-known coronary heart disease risk factors such as cigarette smoking, high blood pressure and high blood cholesterol.

For individuals who do not engage in regular physical activity, taking the first step towards developing a pattern of regular physical activity is important. Each person should recognise that starting out slowly with an activity that is enjoyable and gradually increasing the frequency and duration of the activity are central to the adoption and maintenance of physical activity.

On entry to the Fire Service, firefighters are expected to reach a minimum aerobic capacity of 42mlsO₂/kg/min which is an average to good level of fitness deemed necessary to keep a firefighter safe and 'fit for duty' whilst operating in extremes of heat and wearing breathing apparatus.

At recruitment, the aerobic capacity level of fitness, mentioned above, is measured using the Multistage Fitness Test, which is the equivalent of Level 8 Shuttle 8 in that test before moving on to the job related tests explained below.

Serving firefighters are tested annually where they are required to complete a health questionnaire along with a test to measure body fat percent. Aerobic fitness is measured using a step test or treadmill test where they are expected to meet the minimum standard of 42mlsO₂/kg/min. This is the same for all operational firefighters regardless of age or gender. Every three years they must also pass a medical with a dedicated occupational health team.